

Expert Witness Rebuttal Report – Walder vs. BNSF Railway Company.

Submitted by Julie F. Hart, PhD, CIH
October 7, 2022

October 7, 2022

Mr. Ethan Welder
McGarvey Law
345 First Avenue East
Kalispell, MT 59901

Dear Ethan,

I have reviewed the BNSF expert report materials provided to me pertaining to the Libby Claimants' actions against the BNSF Railway Company, with specific reference to Ms. Joyce Walder. My rebuttal of certain opinions and assessments expressed in those reports follows. This report is authored at your request and direction to provide those opinions and a summary of the grounds therefor. I expect to reference and rely upon opinions and materials referenced or discussed in the other Plaintiffs' experts' initial and rebuttal reports. I reserve the option to alter my opinion based on additional information obtained through discovery or otherwise. The opinions contained herein are to a reasonable degree of scientific probability.

Causation Assessments:

While Dr. Kind admits general causation is satisfied in the context of Libby amphibole asbestos (LAA) exposure, he asserts that specific causation cannot be established without a dose assessment (e.g., Kind Report,¹ pp. 33 & 34). Dr. Kind further discusses the application of exposure assessments to estimate past exposures to chemical agents in the environment (Kind, p. 37). It is important to note that industrial hygiene or toxicology principles indicate that exposure can be assessed using best available data, modelling, data from other applicable sampling, or even just by applying industrial hygiene and toxicology principles to what is known about asbestos containing source materials and the entrainment/behavior of asbestos fibers. Here, there is substantial available evidence of railyard conditions and entrainment of dust therefrom upon which to rely in assessing airborne asbestos levels during the relevant time frames. Moreover, any lack of site/activity specific quantitative data during relevant periods is attributable to BNSF's failure to sample its properties in violation of OSHA regulations and applicable standards of care.² Additionally, Dr. Kind only relies upon qualitative assessment in his report, so under his proposed causation standards his assessment is insufficient to rule out harmful exposure levels.

¹Dr. Kind's report regarding Ms. Joyce Walder is referred to hereafter as "Kind."

²Demonstrative of BNSF's violations of applicable standards of care is that the other corporations engaged in vermiculite related operations, on both ends of BNSF's vermiculite operation, utilized extensive dust control and air monitoring efforts for decades before BNSF's shipments ceased (e.g. W.R. Grace and Scotts). A missing link in the health safety efforts was BNSF's operation where no sampling or dust control measures were utilized, and which took place in close proximity to residential, workplace, and childrens' recreational areas.

Dr. Julian Marshall did perform an air modelling study of emissions and concentrations of Libby amphibole asbestos from the railyard in Libby, MT from non-vermiculite transport sources alone, one of the primary emission sources in Lincoln County. This is just the type of methodology that has been established to estimate past exposures to chemicals and other agents in the environment” that Dr. Kind opines provide applicable exposure estimates. Kind, p. 35 & 36.

Kind, P. 18. Causation Methodology:

The RfC and inhalation unit risk (IUR) for LAA clearly established causation of asbestos-related disease by exposure to LAA. The xenobiotic LAA is capable of causing asbestos related disease. The RfC presents the first published non-cancer reference inhalation concentration for a mineral fiber. Asbestosis, pleural thickening, and other nonmalignant respiratory disease in populations exposed to LAA were considered in the development of the RfC, with localized pleural thickening selected as the “critical effect” (EPA/IRIS., 2014). In June 2009, EPA Administrator Lisa Jackson declared a public health emergency in Libby, citing that the rate of asbestosis in the community were “staggeringly higher than the national average for the period from 1979-1998” (EPA, 2009).

It is important to note that numerous epidemiology studies, many of them focusing on worker and community member cohorts, have revealed elevated rates of pleural thickening and related pulmonary function abnormalities with LAA exposure. As noted in my original report, pleural thickening also presents increased risk for additional asbestos related diseases including lung cancer and mesothelioma (ATS, 2003; Pairon et al., 2014; Larson et al., 2020). Ms. Walder was diagnosed with pleural thickening on December 29, 2014^{3, 4} placing her in a heightened risk category for malignant asbestos related disease as a result of her asbestos exposure. Ms. Walder was diagnosed with malignant pleural mesothelioma on May 19, 2020, and died on October 23, 2020, of pleural mesothelioma. A fiber analysis of Ms. Walder’s lymph node tissue collected adjacent to her lungs revealed fiber burden consistent with her significant LAA exposure.⁵ The scan performed at 15,000x considering fibers > 0.5 µm in length with a 5:1 aspect ratio identified 16 LAA fibers which was equivalent to 78,984 fibers/gram of tissue. In addition, 20 LAA fibers > 3µm were identified when scanned at 2,000x.

At page 19, and again at pages 41-42, Kind sets forth a four-part test he asserts is required to establish “specific causation.” While Dr. Kind’s opinions in this regard are questionable and attempt to unilaterally control issues of causation, which may or may not be relevant here depending on the legal standards applicable in this case, his proposed four-part specific causation standard is, nonetheless, easily satisfied in the present case:

1. The exposure was of sufficient magnitude (concentration and duration) to produce the alleged medical condition (satisfying the principle of dose response). – As set forth in the modelling performed by Dr. Julian Marshall, that only considered exposures resulting from

³ Center for Asbestos Related Disease Report, December 29, 2014.

⁴ Dr. Mark S. Colella, MD Report, July 30, 2022.

⁵ ERI Analytical Report – Case Name – Joyce Walder, September 12, 2022.

the contaminated condition of BNSF's downtown Libby railyard and excluded BNSF's vermiculite transport activities, Joyce Walder's LAA exposures greatly exceeded both the RfC and IUR for LAA. This is further supported by the substantial available evidence of the contaminated condition of BNSF's railyard, sampling performed more than a decade after vermiculite shipments ceased, historic airborne fiber levels in downtown Libby in proximity to the railyard, and firsthand reports and testimony of the extremely dusty conditions present at the site during relevant periods. Conclusive evidence that Joyce Walder incurred an exposure to LAA of sufficient magnitude to cause her mesothelioma is apparent from Dr. Ron Dodson's digestive analysis of Joyce Walder's lymph node tissue, which contained substantial levels of LAA fibers still present in and around her lungs more than 40 years after she moved out Libby.

2. The chemical exposure was temporally related to the onset of the alleged medical condition (satisfying the principle of temporality). – The onset of Joyce Walder's mesothelioma is clearly in line with recognized latency periods for the development of mesothelioma.

3. Potential alternate causes of the medical condition (confounders) can be adequately ruled out (eliminating alternative possible etiologies for the condition). – There is no evidence in the record to suggest that Joyce Walder incurred any significant exposures to mesothelioma causing agents aside from LAA. Additionally, during my interviews of her, I was unable to uncover any such exposures. Dr. Dodson's digestive analysis found substantial levels of LAA fibers and no other mesothelioma causing fibers in Joyce Walder's tissue. Given Joyce Walder's asbestos exposure history, the identification of substantial levels of LAA fibers in her tissue, and the presence of asbestos related pleural changes, spontaneous mesothelioma would be an unreasonable consideration.

4. There is coherence and consistency in the evidence evaluated in this specific case (establishing that the evidence is consistent with all scientific facts). – As set forth in detail in my initial report, as well as the reports of Dr. Arthur Frank, Dr. Steven Compton, Dr. Julian Marshall, and Dr. Ron Dodson, the evidence and scientific facts consistently confirm that Joyce Walder incurred a very significant exposure to LAA fibers release from BNSF's Libby properties. While Joyce Walder undoubtedly incurred some other exposures to LAA while living in Libby, it is beyond dispute that she incurred a very significant exposure to LAA fibers release from BNSF's properties and that those exposures substantially contributed to her development of mesothelioma.

Exposure Assessments:

Kind, p. 31-33. Discussion of NOAEL:

The NOAEL method is a common approach in establishing a reference concentration. However, the EPA adopted a Benchmark model for the development of the LAA RfC (EPA/IRIS, 2014). In Casarett & Doull's Toxicology – The Basic Science of Poisons textbook, commonly referenced in this report by Dr. Kind (Klaassee, 2013), "The NOAEL has been criticized on several points, including that 1) the NOAEL must, by definition, be one of the experimental doses tested and 2) once is the identified, the rest of the dose-response

curve is ignored. Because of these limitations, an alternative to the NOAEL approach, the Benchmark dose (BMD) was proposed....”(p. 134).

“Selecting a benchmark response (BMR) involves making judgments about the statistical and biological characteristics of the data set and about the applications for which the resulting benchmark concentration (BMCs)/lower limit of the BMC (BMCLs) will be used. An extra risk of 10% is recommended as a standard reporting level for quantal data. Biological considerations may warrant the use of a BMR of 5% or lower for some types of effects (e.g., frank effects), or a BMR greater than 10% (e.g., for early precursor effects) as the basis of the POD for a reference value (U.S. EPA, 2012).

LPT is a persistent change to normal tissue structure and is associated with a decrement in lung function on a population level (~5 and ~2.5% decrements in percentage predicted FVC and FEV1, respectively). Larson et al. (2012a) showed a statistically significant increased risk of people with LPT having “restrictive spirometry” and concluded that this abnormality may result in lung function impairment. However, the available data do not lead EPA to conclude LPT should be considered a frank effect and thus EPA selects a BMR of 10% extra risk for this endpoint to fit the data” (emphasis added; EPA/IRIS, 2014 p. 521).

“The exposure-response relationship was modeled, and PODs were estimated using BMC methodology. For inhalation data, the BMC is defined as the exposure level that results in a specified BMR. The RfC is derived from the lower 95% confidence limit of the BMC, referred to as the BMCL, which accounts for statistical uncertainty in the model (EPA/IRIS, 2014 p. 522).”

“Using a 10% BMR for LPT, a BMC of 0.092, and a BMCL10 of 0.026 fiber/cc were calculated for the mean exposure model. Following EPA practices and guidance (U.S. EPA, 2002, 1994b), application of the following default and data-informed UFs was evaluated resulting in a composite UF of 300. EPA/IRIS, 2014 p. 5-41.”

Kind, p. 32. RfCs are not bright line indicators of safe vs. unsafe exposures.

The RfC is not a line indicator of safe vs. unsafe exposures, nor are occupational exposure limits fine lines between safe and dangerous exposures. In fact, at the current PEL of 0.1 f/cc, there is a cancer risk of 3.4 per 1000 workers exposed (1994 Federal Register Vol 59, No. 153 40). Applying the RfC or inhalation unit risk value to risk formulas per EPA guides does, however, provide applicable information in terms of risk. “For non-cancer, if the cumulative HQ (referred to as the hazard index [HI]) is less than or equal to 1, then remedial action is generally not warranted. If the HI exceeds 1, there is some possibility that noncancer effects may occur, although an HI greater than 1 does not indicate an effect will definitely occur. However, the larger the HI value, the more likely it is that an adverse effect may occur (EPA HHRA, 2015 p. ES-4).”

In addition to the RfC for non-cancer effects, the published inhalation unit risk (IUR) value specific to LAA may be applied to estimate the excess lifetime cancer risk from inhalation of LAA. EPA reports cumulative excess cancer risks that are less than 1 in a million to be negligible, while risks greater than 1 in ten thousand to be large enough to require remedial

action (EPA HHRA, 2015 p. ES-4) and the Montana DEQ considers risks greater than 1 in 100,000 to be unacceptable.⁶

As set forth in my original report, as well as the Expert Reports of Dr. Julian Marshall and Dr. Steven Compton, Ms. Walder was exposed to considerable levels of LAA while residing in Libby due to the asbestos contaminated condition of BNSF's downtown Libby railyard. Ms. Walder was diagnosed with asbestos related disease. See, e.g., Expert Reports of Dr. Mark Colella. The hazard indices and cancer risk estimates provided in my original report for the Ms. Walder revealed substantial risk for asbestos related diseases.

Kind, p. 32. The RfCs are up to 10,000-fold less than the NOAEL.

While Dr. Kind is correct in stating that RfCs can at times be up to 10,000-fold less than the NOAEL, this not the case with the LAA RfC. The RfC is derived from the lower 95% confidence limit (BMCL) of the benchmark concentration (BMC) of 0.092 fiber/cc or 0.026 fiber/cc, to account for statistical uncertainty in the model fit to the data and to which an essential uncertainty factor of 300 was applied.

Exposure History Summary:

Dr. Kind relies on Ms. Walder's residential and activity-specific exposure durations, a 2001 BNSF air sampling report, and an indoor asbestos dispersion study (Donovan, 2011) to conclude that while LAA can cause mesothelioma (Kind, p. 41), "there would be no potential for any asbestos exposures in excess of background levels at these [Ms. Walder's] residences due to BNSF's activities" (Kind, pg. 43), that her activities reported in her Center for Asbestos Related Disease (CARD) questionnaire would "likely result in measurable asbestos exposure" (Kind, p. 44 & 45), and that "these exposures are not attributable to BNSF" (Kind, p. 45).

Dr. Kind misleads the reader by misreporting outcomes from a 2001 sampling report in the Libby railyard to support his claim that Ms. Walder's activities "near the railroad tracks or recreational activities that allegedly put her in proximity to the railroad tracks would not have yielded asbestos exposures in excess of background levels related to or caused by railroad activity" Kind, p. 42. From this 2001 sampling report, which was conducted 23-47 years after Ms. Walder resided in Libby, and 11 years after the closure of the W.R. Grace vermiculite

⁶ Montana DEQ: <https://deq.mt.gov/cleanupandrec/Programs/superfundstate>, FAQ section, which provides that "DEQ considers an additional or excess 1 in 100,000 chance (or 0.001% or 0.00001 or 1×10^{-5}) allowable. (The Montana Legislature has directed that 1×10^{-5} is an allowable risk for state water, § 75-5-301, MCA, and based on that level, DEQ has determined that 1×10^{-5} is an appropriate risk)." ... "DEQ allows cleanup levels calculated based on cumulative risk levels less than or equal to a total excess cancer risk of 1×10^{-5} for carcinogens or a total hazard index less than or equal to 1 for non-carcinogens." ... "Cumulative cancer risk for carcinogenic compounds may not exceed 1×10^{-5} . Total hazard index for non-carcinogenic compounds may not exceed 1 for each target organ." See [MTDEQ FAQ Excess Lifetime Cancer Risk](#), and [MTDEQ FAQ What do we consider allowable risk](#).

mine, Dr. Kind reports the results of only the personal samples, and he states that the highest personnel sample was 0.092 f/cc. However, sample number 124, a personal breathing zone sample reported for George Gray while he was brooming the yard was 2.6 f/cc, more than double the OSHA short term exposure level (STEL) of 1 f/cc. It is important to note that many of the personal samples were collected while workers were inside equipment cabs and that the workers were aware of the potential for asbestos exposure at the time of the sampling. Of the 71 samples collected, when area samples are included along with personal samples, 47 (66%) revealed detected levels of asbestos, with levels as high as 7.2 and 14 f/cc reported for brooming activities. Mr. Don Cleveland, CIH, Director of Industrial Hygiene for BNSF, utilized the results of the 2001 sampling report to inform personal protective equipment (PPE) requirements for the workers. Employees conducting work which may impact soil were required to wear disposable coveralls and a half-mask respirator, while employees conducting work which may impact soil in an aggressive manner were required to change out of street clothes and don coveralls and wear a powered air purifying respirator (BNSF 2356 & 2357). Furthermore, Mr. Cleveland recommended to keep all BNSF MOW personnel out of the Libby Yard to the extent possible (BNSF 2370). The air concentrations reported in the 2001 sampling report cited by Dr. Kind do not support his statement that “activities in proximity to the railroad tracks would not have yielded asbestos exposures in excess of background levels related to our caused by railroad activity,” Nor do they support his statement that “Airborne concentrations of asbestos fibers in the Libby railyard during these sampling efforts were extremely low.” The results reported during these sampling efforts ranging up to 14 f/cc are the highest reported airborne asbestos results of which I am aware in the Libby area for the period following the closure of the vermiculite mine in 1990 and exceed the great majority of the airborne asbestos levels measured at the mine and mill even during active vermiculite mining and processing activities. Based on these findings, the EPA determined that railyard “activities can entrain high levels of asbestos fibers.” See, e.g., Excerpt of Administrative Order on Consent attached. To call these results “extremely low” belies reason.

Kind Report, p. 42, Dr. Kind cites Donovan et al., (2011) to support the statement that asbestos fiber concentrations 30 feet from the source would be 1% or less of the source concentration and asbestos fiber concentrations 75 feet from the source would be 0.0001% of the source concentration. “Thus, it would take an extremely high LAA fiber concentration at the RR tracks (which is not supported by available evidence) to result in even a measurable exposure at any of Ms. Walder’s Libby residences.” Dr. Kind’s statements regarding concentrations at a distance from an airborne asbestos source are premised on the indoor air pollution model proposed in Donovan (2011). As described in the Rebuttal Report of Dr. Julian Marshall (2022), the Donovan (2011) article is completely inapplicable to the present case involving outdoor ambient air asbestos pollution and Dr. Kind’s use of the study in this setting is not consistent with accepted industrial hygiene or toxicology principles. Even as to the inapplicable modelling of indoor air pollution, the Donovan (2011) article has significant shortcomings. See, e.g., Egilman and Schiling (2012); Rebuttal Report of Dr. Julian Marshall. Contrary to Kind’s opinion, relevant modeling, mapping, and literature demonstrates toxic levels of asbestos emanate to great distance from industrial level activities involving asbestos containing materials. See, e.g., Report of Dr. Julian Marshall; Kurumatani, Norio & Kumagai, Shinji. (2008). Mapping the Risk of Mesothelioma Due to Neighborhood Asbestos Exposure. American journal of respiratory and critical care medicine. 178. 624-9.

10.1164/rccm.200801-063OC, demonstrating toxic exposure to asbestos and resulting disease occurred in communities at a distance up to and including 2,200 meters from industrial plant utilizing asbestos containing materials; Kumagai, Shinji & Kurumatani, Norio. (2007). Risk of developing mesothelioma due to neighborhood exposure to asbestos. *Journal of occupational health*. 49. 77-88. 10.1539/sangyoeisei.49.77 Newhouse and Thompson, 1965; Magnani et al., 1997, 2000, 2001. This effect has been documented in Libby. See, e.g., W.R. Grace's 1975 downtown asbestos sampling. As set forth in my initial report and Dr. Compton's report, once entrained, asbestos fibers can remain suspended for long periods of time and travel significant distances.

Kind, Tables 2 and 3, p. 38 - 41:

Dr. Kind utilizes results for an intake form that Ms. Walder completed at the CARD clinic in 2013 to summarize her exposure duration to sources of LAA while living in Libby. This form is not comprehensive and is largely focused on the most easily identified and cataloged vermiculite encounters that could be experienced in Libby, rather than attempting to assess an individual's most substantial asbestos exposure sources. I performed an extensive interview of Joyce Walder on June 6, 2020, at which time she was quite sharp and had good recall of her time in Libby. Based on this interview, as well as information obtained elsewhere, including through the interviews of friends and family members as well as the deposition of Judith Hemphill, there appear to be numerous inaccuracies in the exposure information relied upon by Kind. A check box form filled out during intake for a doctor's appointment is a poor surrogate for the interviews, deposition testimony, and documentary history upon which my opinions are based. Accordingly, Dr. Kind's report is based on a somewhat inaccurate history of facts, events, and activities. Certainly, in completing an intake form at a doctor's visit, one is not likely taking the time and careful thought appropriate had they known such a questionnaire would be the sole basis of exposure estimates used by an expert in a legal proceeding.

As one example, the activity specific estimates of exposure duration in the CARD intake form do not consider the contribution of LAA exposure from the ambient environment in Libby as a component of the plaintiff's estimated exposure duration. As explicated in the expert report of Dr. Julian Marshall, Joyce Walder incurred a substantial exposure to asbestos dust released as a result of just the contaminated condition of the railyard into the air in the downtown Libby area not represented in the form.

The activity specific estimates of exposure duration reported in Tables 2 and 3 do not consistently align with the results of my personal interview with Ms. Walder.⁷ For example, in my discussion with Ms. Walder she did not recall her family using Zonolite (vermiculite) for gardening in any of her homes, while in Table 2 this activity is reported with a total duration of 1,200 hours. Table 2 reports that Ms. Walder spent 1,200 hours playing in or watching games at the downtown ballfields. Notably, the ballfields (including Legion Field) were located adjacent to BNSF's downtown Libby railyard. Also notable, is that this number far exceeds that applied by Dr. Marshall in his exposure modelling and application of this

⁷ Telephone interview with Ms. Joyce Walder – June 26, 2020.

number would greatly increase his exposure estimates. Table 2 reports that Ms. Walder spent some 300 hours heating vermiculite to make it expand, which is inconsistent with my interview and an obvious over estimation. Table 2 reports that Ms. Walder spent 1,800 hours in or around vermiculite piles. Although, in her interview, Ms. Walder recalled playing on occasion on vermiculite piles adjacent to the railyard, it is unclear from the call of the form question what is encompassed by “being around vermiculite piles” and whether this includes her time spent on the railroad property, on the ball fields, or running track at Legion Field adjacent to the railyard. It is certainly not my understanding that Ms. Walder spent 1,800 hours playing in piles of vermiculite. Table 3 reports that Ms. Walder lived with a Lumber Mill worker for 14 years and with a vermiculite worker for 12 years. There is no indication that Ms. Walder ever lived with a vermiculite mine or mill worker. These form entries appear to be in reference to the fact that her father, who passed away when Ms. Walder was 12 years old, worked as a logger with his own truck and delivered logs to Lumber Mill. Ms. Walder also recalled that her father worked at the Lumbermill during some winter periods but did not recall how many. In addition, she recalled her brother worked at the Lumber Mill as a millwright for a period of time following his graduation. These periods of employment are the most likely explanation for the intake form entries reporting having lived with a Lumber Mill worker for 14 years and a vermiculite worker for 12 years. The same holds true for the subsequent entries regarding vermiculite workers in Table 3.

Kind, p. 38 – Provides a summary of Dr. Kind’s understanding of Ms. Walder’s residential locations during her time living in Libby. Notably absent from this list is her residence at the trailer park on the 2nd Street Extension where she lived from 1968-1969, which property abutted the railroad and was in proximity to BNSF’s downtown Libby railyard.

Kind, p. 45 – “Ms. Walder’s reports of playing in waste piles would likely result in measurable exposures to LA during her childhood play.” Ms. Walder did not report playing in waste piles. In addition, the mine waste that Dr. Kind opines was used to construct school sporting facilities and the local ice-skating rink were, according to Kind, applied after her graduation from high school.

Kind, p. 40 – “Records show that Ms. Walder estimated she fished or floated on the Kootenai River near the mouth of Rainy Creek one hour per day fifteen days per year for twenty years.” Notably, the Kootenai River near the mouth of Rainy Creek is where the river loading point was located on BNSF property. The Kootenai River is also flanked by BNSF’s tracks during its entire course through the Libby valley. As such, these activities provided substantial opportunity for Ms. Walder to be exposed to asbestos dust emanating from BNSF’s properties.

Kind Report, p. 24, Several values are presented for background levels of asbestos in the environment.

According to EPA (2013), the most recent and most extensive report on the concentration of asbestos in outdoor air was provided by Lee and Van Orden (2007). Based on TEM measurements, a mean value of 0.00003 f/cc > 5 μ m was observed for a data set of 1,678

outdoor samples collected in urban areas across the United States. Similar results have been reported by several others, including:

- Van Orden et al. (1995) observed a mean concentration of 0.0002 f/cc > 5 μ m in a set of 25 measurements taken in outdoor air in the San Francisco area within five days of the 1989 Loma Prieta earthquake.
- USEPA (1988) (also reported in Chesson et al. 1991) reported a mean of 0.0004 f/cc > 5 μ m in a set of 48 outdoor air samples collected in the vicinity of public buildings in five different geographic zones of the United States. As in the report by Lee and Van Orden (2007), the standard deviation was quite large (1E-03 f/cc > 5 μ m), reflecting substantial between-sample variability.
- The Health Effects Institute-Asbestos Research (HEI-AR 1991) reviewed a wide range of published and unpublished reports on asbestos levels in outdoor air, and concluded the mean in rural areas was about 0.00001 f/cc > 5 μ m, and was about ten-times higher (0.0001 f/cc > 5 μ m) in urban areas.
- One of the most recent studies evaluating outdoor asbestos concentrations in urban environments was conducted in Houston, Texas by Ward et al (2021).⁸ Twenty-nine samples were collected over 10 days in two separate locations within the Greater Houston area. Houston was selected due to the abundance of industrial sites (refineries, petrochemical plants, and ports), the presence of high population densities and the propagation of freeways. Analysis by TEM revealed no detectable asbestos structures. The authors conclude that asbestos, if present, was presumed to be below the detection limits of 0.0001 f/cc for TEM by ISO 10312 analysis.

Average concentrations in outdoor ambient air tend to range between about 0.00001 and 0.0004 f/cc > 5 μ m, with an overall mean of about 0.00001 to 0.00003 f/cc > 5 μ m. In general, concentrations in rural and remote areas tend to be lower than urban areas (EPA 2013).

Kind, p. 6-9, Dr. Kind relies heavily upon Quivik, 2002, the report of a historian submitted in the W.R. Grace criminal trial, in the description of Libby vermiculite operations. Quivik, 2002 notes that the first railroad shipment from Zonolite began in 1925 (Quivik, 2002, p. 10). The objective of the Quivik report was to provide detail of the vermiculite mine operation and the potential impact to Libby. Since the focus was not on railroad transport of vermiculite, it should not serve as a primary reference for conditions in Libby during active vermiculite transport years. Interviews with dozens of railroad workers has revealed overloading and spilling of vermiculite on railcars at the river load out and subsequent blowing of asbestos laden dust into Libby, consistent leaking of vermiculite from railcars at the railyard, and piles of vermiculite in the railyard so high that they were constantly kicked down to prevent tripping on them in the night when checking cars.

⁸ S. M. Ward, D. Liddle, W. Colbert, and L. W. Poye, "Background Levels of Asbestos Detected throughout the City of Houston, Fourth-Largest City in the United States," in *Asbestos and Other Elongate Mineral Particles—New and Continuing Challenges in the 21st Century*, ed. J. R. Millette and J. S. Webber (West Conshohocken, PA: ASTM International, 2021), 127–136. <http://doi.org/10.1520/STP163220200052>.

Kind, p. 7. Dr. Kind describes the export plant per Quivik, 2002. It is important to note that the export facility was located in downtown Libby to take advantage of BNSF's Downtown Libby Railyard facility. The property was co-owned and by BNSF and W.R. Grace. The facility was regularly inspected by BNSF. The property encompassing the export facility was originally owned by BNSF until portions of the property were sold to Zonolite Co. (later W.R. Grace) for \$1. Kind, p. 10 – "With expansion activities ceasing prior to 1981" – Expansion operations apparently ceased in 1969- See, e.g., 9/25/1969 Western News Article. Expansion during operation was limited and sporadic (less than 1% of vermiculite concentrate mined during that period). Amounts bagged and transported by rail from export were relatively insignificant. Dust from the export facility settling on BNSF's Railyard or its sidings serving the export facility were a workplace hazard for BNSF and should have been tested and controlled. For a large corporate entity, such as BNSF, with established knowledge of asbestos hazards and that the vermiculite contained asbestos the applicable standard of care was to test and control the hazard presented by the co-owned/operated and adjacent export facility. Kind, p 11 - "W.R. Grace provided a dust collector inside the cars and utilized a large air supplied pipe that sat in the car to keep dust from settling in the car (Vinson p. 18)." Dr. Kind misinterprets and misrepresents the Vinson testimony, who actually reports that the bagging facility (located on Grace property) had a dust collection equipment in place, while the railcars that were loaded with the bagged material on the BNSF owned siding did not. (See Vinson Deposition excerpts). Instead, they pumped large amounts of air into the rail cars during the loading process to protect the loading point workers from dangerous levels of asbestos dust, thereby exhausting asbestos laced air directly to outside air in proximity to the ballfields. This was confirmed in testimony from Grace's Industrial Hygienist during the Grace Criminal Trial. (See attached testimony from Randy Geiger in the W.R. Grace Criminal Trial). As such, much of the dust released from the export facility emanated from the activities taking place on BNSF property rather than the adjacent dust-controlled operations on Grace property. BNSF management reported inspecting this facility on a regular basis because it was located on BNSF property. (See deposition testimony of John Swing).

Kind, p. 10 – "Hopper cars staged on the railway on the opposite side of the river were top loaded by a conveyor belt by an operator." Vermiculite concentrate was also side loaded into boxcars, which based on witness reports and video was a very dusty process and resulted in substantial dust covering and leaking from the cars. Kind, p. 11 – "No BNSF employees were involved in the operations of the export plant." BNSF employees dropped and picked up box cars that were loaded on a BNSF owned siding. Dust was not collected during this loading process and was instead forcibly exhausted from BNSF boxcars sitting on the BNSF siding into the surrounding air, contrasting with the dust-controlled operations within the export facility itself. BNSF management regularly inspected the facility. Kind, p. 45 – "The mouth of Rainy Creek is immediately adjacent to W.R. Grace's River loading facility, for which they were responsible for all operations and associated safety precautions." BNSF owned and assisted in the construction of the river loading site. BNSF retained oversight, review, and control of safety precautions and equipment and specifically reviewed and approved the dust control equipment at the river loading site. BNSF supplied cars for loading and pulled them out of the site after they were filled. Per BNSF's own statement in legal documents, "BNSF

operated a loading facility in Libby to transport vermiculite for Grace's benefit." See BNSF's Complaint for Declaratory Judgement.

Anthropogenic entrainment sources referenced by Dr. Kind, e.g., gardening with vermiculite or use of the middle school track, even when taken in sum, would be a lesser contribution to ambient air concentrations compared to 24-hour industrial level operations of BNSF. With respect to the exposure caused by gardening with vermiculite or other such activities, there are many reasons why that exposure would be mitigated (i.e., use of water, short duration of activities, short growing season so only a few months of the year, etc.). As discussed previously in this report, Ms. Walder did not recall gardening with vermiculite in her interview. All of the anthropogenic entrainment sources Dr. Kind references at pages 8-9, such as using tailings for construction of the junior high and high school tracks and the ice-skating rink, supplying contaminated vermiculite to Libby residents, and leasing contaminated properties to members of the Libby community and the City of Libby all occurred around or after the time when Ms. Walder moved away from Libby in 1978 and there is no indication that she would have incurred any meaningful exposure to asbestos from these sources. During the referenced time periods she would have been between 22 and 24 years of age and would not have used the school facilities, and there is no report of her using the skating rink, obtaining vermiculite from stockpiles, or leasing asbestos contaminated property from W.R. Grace.

Kind, p. 13. "Harry Eschenbach, a former health and safety director for W.R. Grace, has testified that he never detected LA asbestos fibers when performing air sampling in downtown Libby." Dr. Kind misleads the reader in that he does not reference or produce any specific sampling results to support this statement. In my review of extensive historical W.R. Grace documents concerning Libby, I have reviewed numerous asbestos sampling records none of which reference any other similar asbestos sampling performed in downtown Libby. There is no evidence that the accuracy of these results was questioned during the time period they were issued and reported by W.R. Grace, and to my knowledge, aside from Eschenbach's deposition testimony 25 years later, have not been called into question since. A review of Mr. Eschenbach's deposition revealed that he did not participate in the air sampling referenced in the 1975 sampling report.⁹ Mr. Eschenbach's testimony in this regard is likely motivated by his potential personal liability, criminal culpability, and his loyalty to W.R. Grace. His opinion is certainly not borne out in the record. Notably, at the time of this testimony, W.R. Grace and its managers, including Mr. Eschenbach, were facing numerous civil lawsuits stemming from their actions in Libby and approximately four years later, Mr. Eschenbach would face formal federal criminal charges for his actions in regard to the Libby operations. (See, e.g., February 2005 Federal Indictment). It is also important to note that the USEPA has repeatedly relied upon these testing results and relies upon this very deposition testimony from Mr. Eschenbach for the conclusion that "Historical airborne fiber concentrations in the residential area of Libby exceeded the present occupational Permissible Exposure Level (PEL) of 0.1 fiber/cubic centimeter established by OSHA 1994 (MRI, 1982;

⁹ Eschenbach Deposition – January 4, 2000, p. 23.

Eschenbach deposition)." See EPA Toxicology Assessment, p. 2. In a summary of risks from exposure to ambient air, air concentrations as high as 1.5 f/cc in downtown Libby when the mine was in operation, are again referenced by the EPA in 2015 (EPA, 2015). The EPA has relied upon these results on numerous other occasions.

Kind, p. 13. Dr. Kind cites Noonan et al. (2015) to support the statement that exposure concentrations for W.R. Grace employees working in the downtown office building were estimated to be 0.0 f/cc. The Noonan et al. (2015) report describes multiple asbestos exposure pathways in the Libby community. Noonan et al. (2015) relies on Amandus et al. (1987) to estimate exposures associated with various W.R. Grace occupations. The mean of three office worker samples which were more likely than not collected in the indoor built environment are presented in the Amandus publication. These are not reflective of the ambient LAA exposure concentrations in Libby, nor were they suggested to be in the Noonan et al. (2015) or Amandus et al. (1987) publications.

Kind, p. 11, Studies examining the health risks of LAA exposure to individuals not directly involved in the mining, processing, or expansion of Libby vermiculite were not published until the early 2000s. It is poor industrial hygiene practice and poor science in general to ignore the health findings from the McDonald and Amandus studies because they were of miners. As stated by Mancuso, 1984: Disease occurs whenever the exposure to the toxic or carcinogenic agent occurs, regardless of the country, the type of industry, job title, job assignment, or location of exposure, and extend the chain of carcinogenic risk beyond the workplace, to the users of the products, to the general environment, the home, wherever and to whomever such exposures have occurred.

Dr. Kind reports that "W.R. Grace began adding soybean oil to vermiculite concentrate in the 1983 – 1984 timeframe, which resulted in substantial decreases in fiber release" Kind p. 12 & 13. While records demonstrate that there was a limited effort beginning in the mid-1980s to treat a fraction of the vermiculite concentrate being shipped by BNSF, the record demonstrates that this had a minor effect on asbestos dust levels produced by BNSF's vermiculite operations. MSDS even from the very tail end of BNSF's vermiculite shipping operations were issued for "Vermiculite Concentrate/Libby Non-Dust Suppressed." See, e.g., 1992 Vermiculite Concentrate/Non-Dust Suppressed, attached to prior report as part of BNSF_HPP_001271-001491 – MSDS Materials Produced by BNSF. It is evident that the majority of shipments during this period of time (mid 1980s to early 1990s) were of non-dust suppressed concentrate. See, e.g., W.R. Grace Shipping Log to Robinson Insulation (1985-19885) less than 1/3 of shipments (9/28) during this period were dust suppressed, attached. Furthermore, any action taken to mitigate fiber release in the timeframe of 1983-1984 occurred after Ms. Walder resided in Libby and is therefore irrelevant.

Kind, p. 21. There are limited studies in the published literature studying mesothelioma rates in the Libby community. Dr. Kind cites (Naik et al., 2017) which evaluated mortality from asbestos associated disease from 1979-2011. The Naik et al. (2017) publication notes that the International Classification of Diseases – Ninth Revision coding system did not contain a specific code for mesothelioma; therefore, only actual mesothelioma cases reported between

1999-2011 were used for the analysis. There were five cases of mesothelioma for this period, with four of them being former mine and mill workers. In addition, Dr. Kind cites Larson et al., (2020) who reported a SMR for residents unassociated with asbestos work as 4.25. As discussed in my original report, a clinical and exposure summary report for 11 individuals diagnosed with mesothelioma who were not Libby mine or mill employees was published (Whitehouse et al., 2008). All cases were non-occupationally exposed individuals. The authors concluded that exposure most likely resulted from Libby amphibole contamination in the community, the surrounding forested area, and areas in proximity to the Kootenai river and railroad tracks that were used to transport vermiculite concentrate (Whitehouse et al., 2008). Elevated rates of mesothelioma associated with Libby amphibole community exposure have also been reported in residential areas outside of Montana. Konen et al., (2019) reported greatly elevated mesothelioma SMRs including among those with “no direct occupational or take-home exposure” but with ambient air exposure in a Minneapolis, MN community near a former vermiculite expansion facility.

Relative Toxicity of LAA:

Kind, p. 19-20 – Dr. Kind cites Garabrant and Pastula, 2018; and Moolgavkar et al. 2010 to support his statement that “the potency of LA to induce both lung cancer and mesothelioma are less than that of commercial amphiboles and in some cases are less than the potencies seen in some cohorts primarily exposed to chrysotile asbestos.” Kind, p. 28 Dr. Kind further cites Hodgson and Darnton, 2000 to present exposure specific risks of mesothelioma from the three principle asbestos types as a ratio of 1:100:500 for chrysotile, amosite and crocidolite, respectively.

Dr. Kind’s summary of the literature does not include a discussion of the RfC and inhalation unit risk (IUR) developed specifically for LAA. It is well established within the scientific community that all forms of asbestos cause mesothelioma. It has been postulated that amphibole asbestos may have a higher potency than chrysotile.¹⁰ Various models have been proposed to quantify the relative potency of amphibole asbestos (primarily crocidolite and amosite) in relation to chrysotile. It is important to note that substantial discrepancies have been reported by researchers when quantifying the relative potency for crocidolite, amosite, and chrysotile mesothelioma induction. For example, the relative potency for mesothelioma induction reported by Hodgson and Darnton was 500:100:1,¹¹ respectively, while values of 26:14:1¹², and 30:15:1¹³ have been reported elsewhere.¹⁴

¹⁰ International Agency for Research on Cancer (IARC). 2018 Asbestos (Chrysotile, Amosite, Crocidolite, Tremolite, Actinolite, Anthophyllite). P238

¹¹ Hodgson, JT & Darnton, A. 2000. "The Quantitative Risks of Mesothelioma and Lung Cancer in Relation to Asbestos Exposure." *Annals of Occupational Hygiene* 44, no. 8 (December): 565-601. <https://doi.org/10.1093/annhyg/44.8.565>.

¹² Leigh J, Robinson B. The history of mesothelioma in Australia 1945-2001. In: Robinson B, Chahinian A, eds. *Mesothelioma*. London: Martin Dunitz; 2000:55-86.

¹³ Henderson D.W. Supplementary Report, On Causation, for Mr. Gregory Lansley. Adelaide, South Australia; 2006 February 27.

¹⁴ Egilman, D. 2009. Fiber Types, Asbestos Potency, and Environmental Causation – A Peer Review of Published Work and Legal and Regulatory Scientific Testimony. *International Journal of Occupational and Environmental Health* 15, Pg 202-228.

An International Agency for Research on Cancer (IARC) mesothelioma working group reported that "there is a high degree of uncertainty concerning the accuracy of the relative potency estimates derived from the Hodgson & Darnton and Berman & Crump analyses because of the severe potential for exposure miscalculation in these studies."¹⁵

In addition to the IARC evaluation, the potential differences of cancer potency based on asbestos mineral groups (chrysotile or amphibole) has been assessed by the EPA. A U.S. EPA Scientific Advisory Board (SAB) Asbestos Committee met in July 2008 to review the U.S.EPA's Office of Solid Waste and Emergency Response's proposed approach to account for cancer potency based on mineral groups and particle dimensions (length and width).¹⁶ The Committee concluded that the scientific basis of the proposed method was "weak and inadequate," especially with "respect to the available epidemiology, toxicology, mechanism of action, and susceptibility information." The Committee further urged the Agency to support additional research and validation of alternative risk assessment models, noting that, "the ongoing research effort focusing on amphibole asbestos exposure in Libby, Montana would yield valuable data and insights to further this scientific effort."¹⁷

Considering the discrepancies in potency models, as noted above, as well as a lack of endorsement by regulatory and advisory groups, suggests that careful consideration should be applied when adopting these methodologies. Furthermore, the fact that an IUR specific for LAA is published must be noted.

All forms of asbestos are toxic. Asbestos is considered a Group 1 human carcinogen (IARC, 2018). BNSF knew that they were transporting vermiculite laden with asbestos. Actions should have been taken to control exposures both to workers and the public.

As noted in my original report, a toxicological review, specific for LAA has been published and includes both a RfC for non-cancer effects as well as an IUR for cancer risk (EPA/IRIS, 2014). As noted in my initial report, the RfC for LAA represents the first published non-cancer reference inhalation concentration for a mineral fiber and it is substantially lower than historic exposure limits for asbestos. Asbestosis, pleural thickening, and other nonmalignant respiratory disease in populations exposed to LAA were considered in the development of the RfC, with localized pleural thickening selected as "the critical effect" (EPA/IRIS, 2014). The Marysville cohort was selected due to the strength of the industrial hygiene data and exposure response relationships and the lack of confounding residential/community exposures to LAA. The IUR represents the upper-bound estimate of cancer risk from chronic inhalation exposure to Libby amphibole at 1 fiber/cc only mesothelioma and lung cancer models and is based on the Libby vermiculite mine and mill cohort (EPA/IRIS, 2014). While an IUR value existed

¹⁵ International Agency for Research on Cancer (IARC). 2018 Asbestos (Chrysotile, Amosite, Crocidolite, Tremolite, Actinolite, Anthophyllite). Pg. 239

¹⁶ EPA (2008) Office of the Administrator Science Advisory Board (SAB). SAB Consultation on EPA's Proposed Approach for Estimation of Bin-Specific Cancer Potency Factors for Inhalation Exposure to Asbestos. EPA- SAB-09-004.

¹⁷EPA (2008) Office of the Administrator Science Advisory Board (SAB). SAB Consultation on EPA's Proposed Approach for Estimation of Bin-Specific Cancer Potency Factors for Inhalation Exposure to Asbestos. EPA- SAB-09-004.

for other types of asbestos (chrysotile, amosite, or mixed-mineral exposures (chrysotile, amosite, crocidolite)), the IUR developed with the LAA toxicological review is specific for LAA.

Kind, p. 20, Dr. Kind cites animal studies to assess the potency of LAA relative to other forms of amphibole asbestos and opines that the toxic potency of LAA is similar to or less than that of amosite asbestos specifically citing “data indicated that 0.65 mg amosite resulted in a higher degree of pulmonary injury, inflammation and fibrotic events than LAA at the same mass dose” (Padilla-Cardin et al., 2011). It is important to note that this study compared effects from a single installation of PM_{2.5} LAA and amosite fibers with equal mass dose, but not fiber morphologies. The amosite fibers used in this study were significantly longer ($1.9 \pm 2.1 \mu\text{m}$ vs. $6.9 \pm 12 \mu\text{m}$, respectively). Therefore, “no definitive conclusions can be reached as the role of fiber type in relative LAA toxicity compared to the reference [amosite] sample” (Cyphert et al., 2015).

Kind, p. 20, Dr. Kind cites Gavett et al., 2016 to describe the relative toxicity of LAA and opines, “after 13 weeks treatment there was no difference in lung inflammation markers in bronchiolar lavage fluid or in lung pro-inflammatory cytokines in rats treated with LAA and an equivalent concentration of amosite asbestos.” It is critical to note that the Gavett et al., 2016 study revealed inflammatory, fibrogenic and tumorigenic effects in the lung which correlate quite well to LAA asbestos related disease in humans. Several markers of lung injury and pro-inflammatory responses persisted 3 months post exposure and histopathology changes were observed 18 months after exposure among LAA groups.

Kind, p. 20, Dr. Kind cites Cyphert et al., 2015 to opine that “there was no difference observed in the toxic potency of LAA vs. amosite.” It is critical to note that the Cyphert et al., 2015 study, as with the Gavett et al. 2016 study, revealed measured effects that correlate well to LAA asbestos related disease in humans. In addition to inflammatory and fibrogenic effects, both fiber types produced tumor development, with three mesotheliomas observed with LAA. See, also, Case (1991), p.494, states regarding an animal study: “significantly, the tremolite fibers were amongst the most carcinogenic tested, with actual incidence of 75% and ‘percent tumor probability’ of 100%.”

Kind, p. 25, Dr. Kind asserts that the no threshold hypothesis for mesothelioma does not hold true. As noted in my original report, it has long been recognized that asbestos is the causative agent in the vast majority of mesothelioma cases and that it can be associated with relatively low levels of asbestos exposure. The no threshold hypothesis issue raised by Kind is not relevant in the case of Ms. Walder where this is a well-documented substantial asbestos exposure history, substantial LAA fiber burden in her tissues, and underlying asbestos induced pleural disease.

Kind, p. 26 & 27. Dr. Kind cites Pierce et al. 2008 to describe NOAELs reported for chrysotile-exposed cohorts, noting 15-500 f/cc-years and 25 to 1000 f/cc-years for mesothelioma and lung cancer, respectively. Furthermore, Dr. Kind asserts that a cumulative dose of 25 f/cc-years is required to cause asbestosis and 25 to 100 f/cc-years is the dose required for the development of clinical asbestosis.

While it is thought that 25 fiber per cubic centimeter years (f/cc years) of chrysotile asbestos exposure is sufficient to cause asbestosis, the threshold exposure for amphiboles in general and LAA in particular, as illustrated in Lockey et al., (2015) and Rohs et al., (2007) has been reported as substantially lower. In addition to fiber/cc years and relation to disease, it is important to note that while Lockey et al., (1984) demonstrated the prevalence of pleural changes in 2.0% of the cohort in 1980, the prevalence increased to 28.7% in 2004 and included 15% prevalence of pleural changes in workers with lifetime CFEs of 2.2 f/cc-years or less (Rohs et. al. (2007)). When subjects in the 1980 cohort were evaluated with high-resolution or conventional chest computed tomography (HRCT/CT) or chest radiography, of the cohort with CFE estimates of 0.45 to less than 1.35 category, 53% revealed pleural changes (Lockey et al., (2015)). In addition, Rohs et al., (2007) identified an average cumulative LAA fiber exposure for interstitial disease of 11.37 fiber/cc years with a standard deviation of 6.82 fiber years, demonstrating that LAA causes interstitial fibrosis at significantly lower levels than reported in the studies relied upon by Dr. Kind. When the fiber/cc-year risk levels presented by Dr. Kind for mesothelioma, lung cancer and noncancerous effects are compared to the published IUR and RfC specific for LAA, substantial excess cancer and noncancer health risks are observed.

Kind p. 28 and 29. Dr. Kind describes the role that fiber length plays in the potential for lung disease. However, he fails to include a discussion of fiber diameter.

A common toxicological justification for the counting rule is that short fibers are cleared more readily from the lungs¹⁸ and that longer fibers impair the phagocytic process.¹⁹ Other research suggests that longer fibers have a greater potential than short fibers to generate an inflammatory response via reactive oxygen species production.²⁰

In an analysis of fiber dimension in predicting the disease risk in chrysotile exposed workers, longer fibers (greater than 10 μm long) were found to be the strongest predictors of lung cancer.²¹ However, lung cancer and asbestosis were most strongly associated with exposure to thin fibers (less than 0.25 μm diameter).²² This implies that fiber *diameter* may play a crucial role in asbestos fiber toxicology.

¹⁸ Dodson, RF, Atkinson, MAL, Levin, JL. 2003. Asbestos Fiber Length as Related to the Potential Pathogenicity. Am Jour Ind Med. 44. Pg. 291-197.

¹⁹ Stanton, MF, Layard, M, Tereris, A, Miller, E, May, M, Morgan, E, Smith, A. 1981. Relation of Particle Dimension to Carcinogenicity in Amphibole Asbestoses and Other Fibrous Minerals. Journal National Cancer Institute. 67. 5. Pgs. 965-987.

²⁰ Palomaki, J, Valimaki, E, Sund, J, Vippola, M, Clausen P A, Jensen, KA, Savolainen, K, Matikainen, S, Alenius, H. Long, Needle-like Carbon Nanotubes and Asbestos Activate the NLRP3 Inflammasome through a Similar Mechanism. 2011. American Chemical Society. 10.1021/nn200595c

²¹ Stayner L, Kuempel E, Gilbert S, Hein M, Dement J. 2008. An epidemiological study of the role of chrysotile asbestos fibre dimensions in determining respiratory disease risk in exposed workers. Occup Envir Med 65. Pg. 613-619. Doi10.1136/oem.2007.035584.

²² Stayner L, Kuempel E, Gilbert S, Hein M, Dement J. 2008. An epidemiological study of the role of chrysotile asbestos fibre dimensions in determining respiratory disease risk in exposed workers. Occup Envir Med 65. Pg. 613-619. Doi10.1136/oem.2007.035584.

In terms of mesothelioma health risks, Suzuki (2005) concluded that "contrary to the Stanton hypothesis, short, thin asbestos fibers appear to contribute to the causation of human malignant mesothelioma."²³ Short and thin fibers were the predominant fiber type detected in lung and mesothelial tissues from human mesothelioma patients.²⁴

Additional data presented by Dodson et. al. (2003)²⁵ argue that asbestos fibers of all lengths induce pathological responses, and that caution should be exerted when an attempt is made to exclude any population of inhaled fibers, based on their length, from being contributors to the potential for development of asbestos-related diseases. Dodson et al. (2003) further noted that "the Stanton hypothesis suggested that the carcinogenicity of fibers depended on the dimension and durability rather than on physicochemical properties" [Stanton et al., 1981]. "However, when one reads the findings of the study more carefully, it also indicates that the "probability of pleural sarcoma correlated best with numbers of fibers that measured 0.25 μm or less in diameter and more than 8 μm in length, but relative high correlations were also noted with fibers in other size categories having diameters up to 1.5 μm and lengths greater than 4 μm [Stanton et al., 1981]."²⁶

In a 2001 memo, Dr. Christopher Weiss reported that in Libby, MT calculations of risk based on PCM or PCME (PMC equivalent based on a TEM analysis and PCM counting rules) consider only a fraction of the total fibers present.²⁷ Fiber lengths ranging from less than 1 μm to more than 20 μm , and fiber thicknesses range from around 0.1 to 1 μm were reported. Dr. Weiss noted that PCM counting rules for Libby amphibole fibers (thicker than 0.25 μm , longer than 5 μm , and with an aspect ratio of 3:1 or greater) include only about one third of the total fibers observed. "The likelihood that Libby amphibole fiber toxicity is confined strictly to fibers in this regulatory size fraction is neither toxicologically sound nor supported by the available health data from Libby."²⁸

Kind, p. 21 – Only 20% of mesotheliomas in women are related to asbestos exposure. While malignant mesothelioma rates are lower in women, Malignant mesothelioma rates in women that can be attributed to occupational exposure has been reported as comprising between 23-40% of such cases. (Spirtas et al., 1994; Rake et al., 2009). Five of the 11 (45%) of the non-occupationally exposed cases of malignant mesothelioma reported in Libby (Whitehouse et al,

²³ Suzuki, Y, Yuen S, Ashley, R. 2005. Short, thin asbestos fibers contribute to the development of human malignant mesothelioma: pathological evidence. *International Journal of Hygiene and Environmental Health*. 208. Pg. 201-210.

²⁴ Sebastien P, Janson X, Gaudichet A, Hirsch A, Bignon J. Asbestos retention in human respiratory tissues: comparative measurements in lung parenchyma and in parietal pleura. *IARC Sci Publ*. 1980:237-46.

²⁵ Dodson, RF, Atkinson, MAL, Levin, JL. 2003. Asbestos Fiber Length as Related to the Potential Pathogenicity. *Am Jour Ind Med*. 44. Pg. 291-197.

²⁶ Dodson, RF, Atkinson, MAL, Levin, JL. 2003. Asbestos Fiber Length as Related to the Potential Pathogenicity. *Am Jour Ind Med*. 44. Pg. 293.

²⁷ Weiss, C. 2001. United States Environmental Protection Agency. Memo to Paul Peronard. 2001. Amphibole Mineral Fibers in Source Materials in Residential and Commercial Areas of Libby Pose an Imminent and Substantial Danger to Public Health. Pg. 1

²⁸ Weiss, C. 2001. United States Environmental Protection Agency. Memo to Paul Peronard. 2001. Amphibole Mineral Fibers in Source Materials in Residential and Commercial Areas of Libby Pose an Imminent and Substantial Danger to Public Health

2008) were females. See also, Mazurek et al., 2022²⁹, reporting mesothelioma rates among women by state and specifically proposing non-occupational/second hand asbestos exposures in the Libby area as the cause of the unusually high mesothelioma rate observed among women in Montana. As noted in my original report, it is frequently reported in scientific literature that female pleural malignant mesothelioma rates are lower than male because female occupational exposures to asbestos are typically less frequent than male exposures (Dodson and Hammar, 2011 p. 375). As a result, mesothelioma rates in females are often considered sensitive indicators to identify environmental exposures to asbestos and other mineral fibers (Baumann et al., 2015; Lacourt et al, 2014). It has long been recognized that asbestos is the causative agent in the vast majority of mesothelioma cases and can be caused by relatively low levels of asbestos exposure. Studies regarding significant levels of spontaneous mesothelioma are not in line with the majority of medical literature and typically fail to take into account unidentified and unreported exposures to asbestos common among non-occupationally exposed individuals.

Kind, p. 21 – The background rate of malignant mesothelioma is estimated between 1-8 cases per million individuals and a substantial percentage are idiopathic ...

As noted in my original report, in an assessment of lung asbestos fiber burden and asbestos exposure history among patients diagnosed with pleural malignant mesothelioma, (Carbone et al., 2012) 11 of 18 (61%) individuals reporting a negative history of asbestos exposure had lung fiber burden concentrations > 0.5 million fibers/dry gram of tissue. Similar results were reported by (Leigh et al, 2002) revealing asbestos fibers in the lungs of 80% of Australian patients with no apparent asbestos exposure. These results suggest that exposure histories may not always accurately reflect asbestos exposure. Individuals with no known occupational exposures to asbestos cannot be recast into the “idiopathic” or “unknown exposure” category. When confronted with an individual who has a demonstrated mesothelioma and an occupational exposure to asbestos, the mainstream scientific community recognizes that the cause of that mesothelioma is the asbestos exposure of the individual even if that exposure was “brief or low-level” (Welch, 2007).

BNSF Remediation Efforts:

Kind, p. 10. Dr. Kind asserts that “although the vast majority of samples taken on BNSF property came back within normal limits, BNSF nevertheless agreed to remove 18,000 tons of soil that **may have contained asbestos.**” [emphasis added] Dr. Kind is misleading the reader with this statement, as he implies that remediation was performed as a good faith effort. In reality, as noted in my original report, 42 miles of rail line, rights-of-way, and railyards owned and operated by BNSF was declared one of eight operable units of Libby Superfund due to the LAA contamination associated with decades of vermiculite transport into and out of Libby (EPA, 2018). As noted in my original report, when soil sampling was performed in 2001, “visibly obvious” vermiculite or biotite was mapped for placement on the CADD map and flagged with surveyor whiskers. However, soil samples were not collected from these flagged

²⁹ Macureck, J., Buckley, D., Weismann, D. 2022. Malignant Mesothelioma Mortality in Women – United States, 1999-2020, Centers for Disease Control and Prevention, MMWR, Vol. 71, No. 19.

areas. Excluding areas with visible vermiculite, 22 composite samples were collected. Libby amphibole asbestos was detected in 5 of the composite samples (PLM NIOSH 9002 concentration < 1%). When one of the composite samples (BN-09000) was analyzed individually, four of five samples revealed Libby amphibole in concentrations at < 1%. Furthermore, the initial soil characterizations occurred more than a decade after the vermiculite ceased operations and after numerous rounds of ballast removal and replacement. The extensive contamination of railroad properties resulted in remediation efforts that extended for more than a decade and involved multiple cleanup attempts.

As discussed in my original report, the Asbestos Court concluded that “there is no question that through BNSF’s activities in Libby, there was a high degree of risk of some harm to members of the community exposed to asbestos dust [.]”

In addition, the railroad cleanup in Libby was mandated by EPA yet BNSF insisted on performing cleanup themselves which was done under an Administrative Order “to address the high levels of asbestos.” See, EPA Initial Pollution Report. Under the Order, BNSF was designated as the responsible party liable for performance of the cleanup of its properties and for response costs incurred at those properties establishing that the cleanup was not a unilateral voluntary effort by BNSF and was performed under the supervision and watchful eye of the EPA. See, e.g., Excerpt of Administrative Order on Consent. Following extensive negotiations with the EPA, BNSF proposed a cleanup plan to EPA that was approved: “The BNSF’s work plan and sampling plan were approved on October 25, 2002. Cleanup began on August 13, 2003. Unfortunately, cleanup was not achieving satisfactory results, so work was stopped on August 21, 2003, and BNSF is reevaluating cleanup options.” *Id.* Following initial cleanup efforts in the downtown Libby railyard using excavators and vacuum trucks to remove the top layers of soil in the yard, clearance results consistently showed asbestos levels in the railyard averaging 2% asbestos. BNSF’s cleanup plan was ceased, and BNSF was directed to develop a new cleanup proposal. The eventual proposed remediation involved the deep excavation, removal, capping and resurfacing of nearly the entire railyard. Thus, Dr. Kind’s assertions that BNSF voluntarily performed the cleanup on its own volition and that the vast majority of sampling results were within “normal limits” are patently false.

Spatial Distribution of Vermiculite Within Libby:

Kind, p. 14 - 17. Dr. Kind uses a data set of pre-remediation soil samples collected by the EPA from 1999-2009 to support his claims that LAA “detections in soil are not clustered around the BNSF railyard or the BNSF tracks and that there is no apparent gradient of soil concentrations of LAA that decreases with increasing distance from the railroad tracks.”

Dr. Kind opines that if fibers from BNSF’s activities were emitted into the air and into the Libby community, one would expect to see a pattern of deposition of the contaminant in soil indicative of higher concentrations near an emission source that attenuate with distance away from the source. While this is somewhat true in principle, one must use appropriate data and accurate measurements in reaching any conclusions in this regard. Kind clearly fails to meet this standard. For example, much of the database relied on by Kind reflects soil sampling performed in gardens, flower beds, yards, and other areas where vermiculite was directly

applied, used, or disposed of. Accordingly, the data set used would obviously not be indicative of asbestos concentrations resulting from the deposition of asbestos from ambient air. The sampling was not performed in a regular or grid pattern in many cases multiple samples were taken from single individual properties where vermiculite was utilized. As such spatial representation of numbers of positive samples would not be representative of ambient asbestos deposition nor provide a meaningful spatial representation of actual asbestos levels in the area. In addition, his mapping technique does not have sufficient sensitivity to meaningfully depict the presence of hazardous levels asbestos (e.g., using 0-1.75% asbestos as a single category). Moreover, ambiently deposited asbestos would be deposited on the very top of any surfaces including grass and vegetation as well as hard non-absorbent surfaces such as roads, buildings, and vehicles where it could and was easily and continually re-entrained into the air and diffused throughout the area. In contrast, where vermiculite was used as an amendment or fill material, it was applied primarily below the ground surface where it would be preserved for later identification during EPA sampling efforts. This serves as another highly confounding factor to Kind's efforts to use the data set to estimate airborne asbestos contributions from the BNSF activities. In contravention of Kind's opinion in this regard, available materials demonstrate that industrial activities involving asbestos containing materials, such as those engaged by BNSF, can and do result in significant airborne asbestos levels in surrounding areas, which can be demonstrated in the absence of documented soil deposition assessments. See, e.g., 1975 W.R. Grace asbestos sampling; the Reports of Dr. Julian Marshall; Kurumatani (2008); Kumagai, Shinji & Kurumatani, Norio (2007).

As discussed in my original report, air concentrations were higher along transportation corridors in Libby years after the closure of the vermiculite mine. In 2006, EPA initiated an ambient air monitoring campaign within the community of Libby and the former mine site (OU3). In 2010, the focus of this program was transferred to ambient air monitoring along transportation corridors (major roadways, railroad, and railyard) in Libby (EPA, 2015, Section 5.1). Monitoring within the community of Libby showed that 58 of the 620 ambient air samples collected (9 percent) revealed detectable phase contrast microscopy equivalent (PCME) Libby amphibole asbestos, whereas 34 of 238 (14 percent) of the samples collected along transportation corridors and 13 of 96 (13 percent) of the samples collected at the former mine site revealed detectable PCME Libby amphibole asbestos. The mean exposure point concentration (EPC) calculated for ambient outdoor air considering the receptor population of residents within the Libby community was 4.8×10^{-6} Libby amphibole s/cc, while the mean EPC for ambient outdoor air considering the receptor population of residents along transportation corridors was 9.8×10^{-6} Libby amphibole s/cc and 2.0×10^{-4} Libby amphibole s/cc at the former mine site (EPA, 2015, Table 5.4). When applied to risk estimates for Libby amphibole in ambient air, the hazard quotients associated with ambient air exposures for residents along transportation corridors are double those calculated for hazard quotients associated with ambient air exposures for residents within the Libby community (EPA, 2015, Table 5.4).

BNSF Knowledge of hazards:

Kind, p. 13. Dr. Kind asserts that "BNSF would not have had reason to suspect that transporting vermiculite concentrate by rail would have led to the potential to result in

community exposures to asbestos.” He bases this opinion on selected EPA reports and limited unrepresentative river loading samples averaging .5 f/cc. Although Dr. Kind concedes W.R. Grace sampling is an appropriate source to assess BNSF’s “available knowledge,” it is misleading to cherry-pick a single sample to do so. A review of the actual sampling record, which likely underreports actual asbestos levels, demonstrates that during applicable time periods river loading samples were high even when based on air levels measured in the vacuum sealed loading booth. See, e.g.:

1. Record OF All Engineering Fiber Samples (TWA) For The Libby Operations: River Loading Railcars: 1985: 0.926859 f/cc, 2.507515 f/cc, 0.971662 f/cc

2. Grace Memo From Geiger to Oliverio dated November 1, 1977:

Three personal samples in excess of 2/0 f/ml were recorded for the month. Ray Carlson at River Loading had concentrations of 2.99 f/ml and 3.34 f/ml during one sample period for a TWA of 3.16 f/ml.

3. Grace Memo From Geiger to Oliverio dated February 10, 1977, on Assessment of Libby’s Pollution Problems Relative to the proposed 2.0 Fiber Asbestos Standard.

The purpose of this report is to provide guidelines for establishing a program for compliance with the proposed 2.0 fiber asbestos standard. Assessment of problems was accomplished by examining air sampling data collected over the past year, compiling this data into average concentrations and ranges of concentrations by area (Table 2) and evaluating the results. In general, problem or potential problem areas were indicated when one or more of the following parameters were met.

1. Average TWA concentrations were near or greater than 2.0 fibers/ml.
2. A significant portion of total sample numbers exceeded 2.0 fibers/ml.
3. One or more 8-hour samples exceeded 2.0 fibers/ml by a significant amount.

Table 2 contains air sampling data collected prior to 1976 grouped into TWA average and ranges of concentration by area. TWA sample averages for this group of data are greater by factors of up to 10 in some areas.

Table 2

1976-1977 Sampling Data

Area	No. Samples Collected	Personal Samples	Concentration Ranges fibers/ml	TWA All Area Samples fibers/ml
River Loadout	10	10	0.41 – 10.01	1.46

In Lockey et al., 1984 *Pulmonary Changes after Exposure to Vermiculite Contaminated with Fibrous Tremolite*, p. 953, “The worker areas with the highest airborne fiber exposure were the vermiculite expanders area and the vermiculite railroad car and truck unloading areas. Fiber levels increased when.... Montana vermiculite ore was used rather than vermiculite from other sources. Fiber levels in the unexpanded vermiculite ore unloading area were recorded as high as 103 f/mil for a 5 min sampling period. During unloading of the ore, high levels of fiber dust were generated, but the peak levels rapidly decreased to concentrations < 5 f/mil by 15 to 20 min.”

In addition, in contrast to the River Loading Station at which dust control and protection measures were utilized, BNSF activities involved no such measures. River Loading samples would not be equivalent to the dust produced through the active transport of vermiculite covered rail cars. More applicable to the present case than the single unrepresentative average value at River Loading relied upon by Dr. Kind are the ambient air level samples taken in downtown Libby in 1975 at up to 1.5 f/cc.

Further, in relying upon selected Agency Publications to establish BNSF’s “available knowledge,” Dr. Kind ignores other publications that clearly communicated the health risk information:³⁰

1. 1977 MSDS for concentrate: “<2.4% by weight of contaminant tremolite, may be fibrillated by physically handling to release airborne asbestos fibers, use dust control techniques and PPE”.
2. Hazards of asbestos were well defined decades before 1981. Late 1970s – bloody pleural effusions noted among Scotts employees, 1980 MSHA document outlining vermiculite as containing asbestos, EPA Libby Vermiculite Asbestos Timeline.
3. MSHA 1980: “The thesis of this report is that, potentially many workers in the mining and associated industries unknowingly may be exposed to asbestiform or

³⁰ At p. 12 of the Kind Report, Dr. Kind asserts that USEPA did not begin to take actions in Libby, MT until after a news article was released in 1999. A company is responsible for the health and safety of their employees, not the federal government. This is conceded by Dr. Kind. See Kind Report – p. 12, “It is usually the responsibility of the industry to obtain and provide such data to EPA.” The Railroad industry was discussing protecting its railroad workers from exposure to toxic dust, including asbestos, and the controls necessary to prevent this exposure, in the 1930’s, four decades before there was an OSHA or EPA. Industrial Hygiene requires a company to research the hazards of the materials to which its workers may be exposed. The 1980’s EPA documents and 1980 MSHA document were clear in discussing the hazards of the asbestos-contaminated vermiculite. The McDonald and Amandus studies found significant health effects associated with asbestos-contaminated vermiculite. Even earlier the U.S. Public Health Service and the Bureau of Mines were evaluating and discussing the hazards of the Libby asbestos-contaminated vermiculite. Nothing was stopping BNSF was seeking information from these sources as part of their research as to the hazards of the materials to which its workers may be exposed.

fibrous mineral which occur as gangue minerals. Cralley et.al, reported over 100 different minerals with some degree of fibrous structure; their example include, and rightly so, minerals other than hydrated silicates. These minerals may be found in ore deposits, rock quarries or soils not normally associated with commercial asbestos, and may become airborne by natural atmospheric conditions or by' conventional."

"Airborne dust does not necessarily have the same mineral composition percentages as the parent rock. The fine fibrous fraction may comprise a greater proportion of the airborne dust than the parent rock."

"The important vermiculite ore deposit at Libby, Montana contains easily recognizable fibrous tremolite in hand specimens and airborne dust samples under the phase contrast microscope show numerous fibers which are inferred to be tremolite, but electron microscope pictures prepared by Mt. Sinai Hospital personnel demonstrate that chrysotile fibers also are definitely present."

4. EPA 1980-Priority Review Level I – Asbestos-Contaminated Vermiculite: "Employees in the loading area (O.M. Scott, Ohio) are exposed to fiber levels that range from 0.2 to 5 f/cm³ (W.R. Grace & Company, 1979). The identified health effects associated with exposure to vermiculite can be attributed to its asbestos contaminant. However, there is also the possibility that the presence of fibrous vermiculite and other fibrous materials may have enhanced the health problems. The high levels of asbestos fibers and the recent disclosure that the employees of O.M. Scott & Sons who handle asbestos-contaminated vermiculite have existing health problems suggest the possibility of a larger problem, e.g., risks to employees handling similar asbestos-contaminated vermiculite and to consumers exposed to products that contain asbestos-contaminated vermiculite."

"Using the asbestos exposure levels reported for W.R. Grace & Company and O.M. Scott & Sons employees and the linear nonthreshold model, one can derive risk estimates for workers handling asbestos-contaminated vermiculite. In the mining and screening of asbestos-contaminated vermiculite the workers are exposed to at least 0.1 f/cm³. For a 50 year exposure at this level, 1 in 200 workers will die prematurely of an asbestos-related disease. Thus, whether the workers handling asbestos-contaminated vermiculite are exposed to 0.1 f/cm³, 2 f/cm³, or 100 times the OSHA workplace standard (e.g., in the trionizing department workers have been exposed to asbestos levels as high as 245 f/cm³), there is potential for significant risk to workers handling asbestos-contaminated vermiculite."

5. Chemical Control Division Office of Toxic Substances (1982) - Disposition Paper for Asbestos-Contaminated Vermiculite: "There are significant adverse health effects associated with past occupational exposures to asbestos-contaminated vermiculite. It is reasonable to assume that these adverse health effects were mainly caused by inhalation of asbestos, a contaminant in vermiculite. Some high-exposure occupational groups identified include rail workers transporting raw ore, miners, and exfoliators. These three types of occupational exposure were estimated at levels of 4.0 x 10¹¹ fibers per year, 1.7 x 10¹⁰ fibers per year, and 8.3 x 10⁸ fibers per year, respectively.

The primary sources of human exposure to asbestos-contaminated vermiculite result from mining and milling operations, processing, transportation, and commercial and consumer uses. Monitoring data revealed that prior to the installation of more stringent safety controls in 1976, Scott plant employees were occasionally exposed to high levels of airborne asbestos. One air sample taken in the unloading area contained 245 fibers/cm³. Similar high fiber levels have been reported in a plant in St. Paul, Minnesota, which also processes asbestos-contaminated vermiculite; peak levels as high as 163 fibers/cm³ were found. Grace acknowledged the presence of asbestos in vermiculite from that mine in 1971. However, attempts to remove all impurities have been unsuccessful, and some tremolite asbestos remains as a contaminant in the vermiculite. The current asbestos concentration in crude vermiculite leaving the Libby mines has been reportedly reduced from an estimated 10% to about 0.5%. It should be noted, however, that even at these relatively low weight percent levels the number of respirable asbestos fibers may be extremely high, because the size ratio of vermiculite particles to asbestos fibers is very high. Thus, regardless of whether the workers handling asbestos-contaminated vermiculite are exposed to 0.1 f/cm³ or 2 f/cm³ (the OSHA workplace standard), there is potential for significant risk.” (attached).

6. EPA 1983: Subject: Status Report* SEHQ-0383-0473

From: Justine L. Welch Chemical Selection and Profiles Team/CHIB

TO: Frank D. Kover, Chief Chemical Hazard Identification Branch/AD

According to the submitter (W.R. Grace), the Libby vermiculite deposit has been long known to be contaminated with tremolite, an asbestiform material.

With regard to the preliminary results of its own ongoing study, W. R. Grace & Co. reported that the company's "information indicates that of 109 known deaths of former Libby employees, the cause of death for 16 was listed in death certificates or insurance claim forms as lung cancer, and for two others the cause was listed as mesothelioma." The company stated that it did not have "sufficient medical information or sufficient occupational and personal history data in these cases to make a judgment as to the cause of these illnesses." The submitting company also reported that based upon "individual exposure estimates, it appears that certain employees whose work history predates the new mill and who have a cumulative exposure of less than 100 fiber years show signs of asbestos-related disease" and that "all of these employees had exposure levels of more than 2.0 fibers per cc for varying periods of time prior to the new mill."

7. Letter from United States Mineral Products Company to the U.S. Consumer Product Safety Commission, October 24, 1979.

“To assist you in your evaluation, we are enclosing the following copies of documents:”

- i. Cover p. and p. 26 from Asbestos magazine, May 1977, containing a brief article entitled, “Asbestos in Vermiculite”.

- ii. Warning notice to vermiculite ore processors by W.R. Grace dated March 17, 1976.

W.R. Grace & Co. is finding it necessary to use dust control for ore handling and processing to meet current OSHA dust regulations in plants. As employers of workers handling vermiculite ore, you should be aware of these regulations and of pending changes to them.

The most difficult standard to meet applies to a “tramp” mineral found in vermiculite deposits. It is tremolite, defined by OSHA as one of the asbestos family. Dust control systems you install should be selected on the basis of keeping airborne concentrations of this material within limits.

As an ore processor, you should sample air of your operation and take appropriate action regarding the current and proposed OSHA regulations.

- iii. Caution notice attached to a carload of vermiculite (on top half of the sheet) clearly identifying asbestos; and on the bottom half of the sheet the caution notice appearing on the consumer products bag of vermiculite insulation material without any reference to asbestos.

Caution: Product contains asbestos fibers. Avoid creating dust. Breathing asbestos dust may cause bodily harm.

Caution: Avoid creating dust. Breathing dust may be harmful to your health. Use with adequate ventilation, or with respiratory protection.

- iv. Times-Dispatch newspaper article entitled, “Louisa May Feel Problem-Montana Asbestos Fibers May Affect Louisa Mining”.

“As recently as October however, mine workers at the Libby complex were still being exposed to potentially hazardous concentrations of asbestos, according to an inspection report issued Nov. 1, 1975 by MESA’s district office in Denver. From 1973 until earlier this year, most of the workers at the Libby Mine were required to wear respirators to avoid exposure to airborne asbestos fibers. Asbestos fiber counts in and around processing areas at the mine have also consistently exceeded safety levels established in July by the Labor Department’s Occupational Safety and Health Administrations (OSHA).

- v. Newspaper article from Richmond, Virginia Times Dispatch entitled, “Vermiculite Mining Data Is Being Probed By OSHA”.

A report in the 1974 yearbook of the National Institute of Environmental Health Sciences, the Mount Sinai team’s sponsoring agency concluded that “potentially hazardous concentrations of asbestos may be contained in the dust produced by the essential stage of (vermiculite) expansion.”

- vi. Wall Street Journal article dated December 22, 1976, entitled, “Drastic Cut In Asbestos Exposure Urged By Federal Agency For 250,000 Workers”.

“It’s not possible to establish a safe exposure level for the carcinogenic activity of asbestos. Therefore, emphasis should be placed on prohibiting the occupational use of asbestos in other than completely closed operations, and on substituting other products whenever possible.”

- vii. Twelve page health and safety inspection report of W.R. Grace Zonolite mine and mill at Libby, Montana, October 20-23, 1975.
- viii. Letter of representation dated January 15, 1977, indicating that W.R. Grace Monokote fireproofing product does not use commercial asbestos in the manufacture, but acknowledging that trace contaminants of naturally occurring forms of asbestos are present; also letters of November 14, 1978 and February 22, 1979 relative to asbestos in Monokote.
- ix. Copy of letter from Mr. Edward B. Deutsch to the U.S. Senate Committee on Labor and Public Safety dated March 23, 1977.
- x. Letter dated May 2, 1977, from United States Department of Health, Education and Welfare, addressed to Senator Harrison A. Williams indicating that communication was made with the Consumer Products Safety Commission concerning the potential hazards of vermiculite contaminated with asbestos.

8. BNA Occupational Safety & Health Reporter 1977.

In a memorandum to regional administrators and area directors February 10, OSHA reported receiving a study that said that asbestos fibers had been found in vermiculite ore. The report recommended examining vermiculite consumer products as well as monitoring workplace conditions. It proposed that potting soils and litter in particular be examined for asbestos since the products “can be expected to release respirable dust during use.”

An accompanying Grace memo from Eschenbach to Wood dated March 11, 1977, stated that the BNA OSHA Reporter is read by many people in varied industries including construction.

9. Richmond Times Dispatch 5/15/78.

More than half of the estimated 304,000 tons of vermiculite used by U.S. construction and horticultural industries and by individuals last year contained asbestos fibers – a known respiratory carcinogen, according to government and industry sources. Although federal officials are warning vermiculite and rail yard workers of the potential hazard from asbestos dust associated with the insulation, fireproofing and potting soil material that they handle, no government agency or vermiculite producer

has specifically warned consumers of the potential hazard. The Montana rail cars have been labeled to warn rail yard workers and others to “avoid creating dust” in handling the vermiculite ore. “Breathing asbestos dust may cause bodily harm”, the box car signs state. The boxcar warning and its specific wording are required by the Occupational Safety and Health Administration’s asbestos regulations, a Grace spokesman said. (See this and other relevant attached newspaper articles).

Moreover, as discussed in my original report, BNSF received direct notice of the asbestos content and health hazard associated with the vermiculite concentrate including through studies it funded of the vermiculite deposit operations, and through the asbestos warning placards placed directly on BNSF’s railcars beginning in the 70s. Dr. Kind asserts that the “placard refers to ‘asbestiform tremolite’ and not ‘asbestos’, thus potentially confusing a reader not familiar with the nomenclature of asbestos minerals and fibers.” Kind Report, p. 13. Tremolite is a regulated form of asbestos. A large corporation such as BNSF, with documented substantial knowledge regarding asbestos hazards, was well aware of the meaning of “asbestiform tremolite.” The record demonstrates that the railcar warning placards varied in their messaging over the years and at times used the word “asbestos” rather than “asbestiform.”

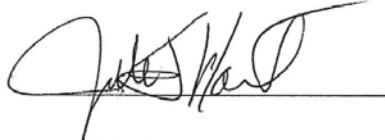
In addition, Dr. Kind implies that these placards were never placed on vermiculite railcars demonstrating an obvious unfamiliarity with, or intent to misrepresent, the record. Dr. Kind’s assertion is refuted by the documentary record including correspondence between W.R. Grace and its customers requesting W.R. Grace to cease the labeling of railcars they were receiving and the testimony of railroad employees including Bruce Carrier and John Swing himself who concedes that if Carrier said the placarding occurred then it did. See, e.g., 6/27/1978 Letter from Scotts to Grace, requesting Grace “remove the placards on cars shipped from Libby to Marysville,” attached; W.R. Grace’s Response to the Second Request for information regarding the Libby asbestos site, the 6/2016 Depositions of Bruce Carrier. Moreover, the Venuti memoranda Dr. Kind has previously relied upon to support his soy-bean oil suppression theories were focused on the possibility of “removal of the asbestos warning label on shipments of Soybean Oil-Treated (SBO) Libby Vermiculite Concentrate.” See 12/1/1983 Venuti Memo. See Grace Criminal Trial Exhibit 409, attached; 11/16/1983 Venuti Memo, “The purpose of this meeting will be to discuss the data base necessary to support removal of the asbestos placard from vermiculite concentrate railcars.

Any industrial hygienist or occupational medicine professional would be familiar with the meaning of the term “asbestiform tremolite.” Unfortunately, there is no evidence that an industrial hygienist ever inspected the Libby operations during active vermiculite operations. Kind, p. 13 – The placard also notes: “This product has been treated with a dust suppressant which significantly reduces potential release of airborne fibers.” Kind’s description of the placard is not consistent with other documentation of the placards.

Kind, p. 13 – Nor was John Swing ever told by BNSF that the vermiculite contained asbestos. Bruce Carrier reported the problems with the dust both verbally and in writing, yet BNSF never evaluated worker exposure to dust on the Libby Log Job. Additionally, the record demonstrates that BNSF received the MSDS for vermiculite concentrate. There were also

warning labels on bagged vermiculite in addition to the placards. That coupled with the fact there was visible vermiculite present throughout the Libby Railyard confirms BNSF had knowledge that the dusty surface of the Libby Railyard contained asbestos.

Dated this 7th day of October 2022

A handwritten signature in black ink, appearing to read 'Julie Hart', written over a horizontal line.

Dr. Julie Hart, PhD CIH

BNSF



DON CLEVELAND, CIH
Director, Industrial Hygiene

The Burlington Northern
and Santa Fe Railway Company

2500 Lou Menk Drive
AOB/GL
Fort Worth, TX 76131

Phone: 817.352.1632
Fax: 817.352.7507
E-mail don.cleveland@bnsf.com

May 17, 2001

Ray E. Stephens
Assistant Vice President, Seattle Service Region
Burlington Northern Santa Fe Railway
2454 Occidental Avenue South, Suite 1A
Seattle, WA 98134

Dear Ray:

Employee exposure assessments for airborne asbestos fibers were conducted during "soil-disturbing" and track maintenance activities in the yard and on the main line in Libby, Montana, from April 17, 2001, to April 26, 2001. The primary BNSF property affected span from approximately milepost 1320 to 1314. The contamination of soil was caused by W. R. Grace during vermiculite mining and processing operations. Subsequently, this was the area where the employee exposure assessments were conducted.

The following paragraphs describe the work practices and personal protective equipment used throughout the assessment, and based on the initial round of air monitoring results, need to be continued until air-monitoring data would demonstrate otherwise.

Three levels of personal protection have been identified based the activities that occur in the area. Although we can not list all of the different activities that could occur in the area, we are asking BNSF employees to "size-up" their specific activities relative to those listed below and use the corresponding PPE.

1. Employees who do not impact the soil such as track inspectors, TEY personnel, or officers hi-railing in the area are not required to wear PPE above and beyond what they would normally wear while conducting business on railroad property. We do encourage these individuals to wash off their boots with water when they are finished working in the area.
2. Employees who "moderately" impact the soil such as changing out a tie, hand tamping the ballast, track welding and rail grinding are required to wear a disposable cover-all and a half-face respirator. They need to be enrolled in the BNSF Respiratory Protection Program, medically qualified to wear a respirator and must come to work clean-shaven. At the end of their work activities, they must remove the disposable suit and dispose of it in a polyethylene plastic bag. They must wash off their boots with water and clean their respirators. We have made available disposable hand wipes and encourage their use during the day at such times as coffee and lunch breaks, or any time when they might choose to smoke, eat and/or drink.

COR00001 07/00

3. Employees who impact the soil in the most aggressive manner, (i.e., surfacing crew employees) are required to wear the maximum protection prescribed for this area and adhere to the following decontamination guidelines:
- Wear full-faced *Powered Air Purifying Respirators*.
 - Change out of their street clothing and don re-usable or disposable coveralls.
 - Any type of re-usable garment that is worn during the workday needs to stay on the "dirty" side of the decontamination trailer and must be washed by a professional laundry service. BNSF must supply these individuals with an ample supply of re-usable and or disposable garments
 - Employees must wash off their boots with water and clean their respirators.
 - Employees must vacuum off the gross debris on the outside of their coveralls prior to entering the decontamination trailer.
 - Employees must take a shower in the "decontamination trailer" prior to donning their street clothing.

Lance Vallone, manager of safety for this territory, has been fully briefed on the proper procedures for employees engaged in work activities in this area, and has assumed full responsibility for overseeing the decontamination procedures, respirator qualifications, respirator fit-testing and record keeping. He is also responsible for ensuring the stocking PPE and coordinating laundry services for re-usable work garments.

My group will continue to conduct air monitoring in the future on BNSF employees working in this area. Air monitoring is currently taking place this week to assess air concentrations during the fire-guarding procedures. Additionally, the IH department will conduct air monitoring on the main line during the dry season during maintenance of way activities. To this end, we have asked the engineering department to keep us apprised of all scheduled activities in the area as well as emergency activities as they occur.

I would like to take this opportunity to thank Roadmaster Arne Olson for his support during the air monitoring activities and give special recognition to his *section employees* for all of their help and cooperation during this challenging air monitoring project. These employees work environments were significantly augmented while accommodating the stringent protective measures that we imposed throughout this assessment, and should be commended for their efforts to make BNSF a safe work environment.

Please call me at 817-352-1632 with any questions that you may have.

Sincerely,



Don Cleveland

cc: Carl Ice
Gloria Zamora
David Dealy
Mark Kotter

Jim Shea
Lavoy Reed
Bob Attridge
John Gooding

Dave Hestermann
Art Charrow
Arnie Olson
Lance Vallone

Mark Mitchell
Dan McCaskill
Dennis Bullock

COR00001 07/00

Libby, Montana
Asbestos Air Sample Results
Samples were collected on April 17, 2001

Sample ID	Type	Location	Sample Duration (minutes)	Sample Results (F/CC)	Comments
1	Blank	NA	NA	ND	ND
2	Area	Hi-rail cab	86	<0.0054*	ND, Hi-railing through project area
3	Personal	Smith	43	<0.011**	ND, Hi-railing through project area
101	Personal	Westrum	474	<0.001*	ND, Riding in trailing unit-Libby Local
102	Personal	Whitcher	482	<0.00097*	ND, Conductor, lead unit
103	Personal	Downing	464	<0.00099*	ND, Brakeman, lead unit
104	Personal	Cole	460	<0.00099*	ND, Engineer, lead unit
105	Personal	Downing	84	0.0039**	Brakeman, lead unit, on the ground switching in the yard
106	Personal	Whitcher	78	<0.0058**	ND, Conductor, on the ground switching in yard
107	Personal	Cole	75	<0.006**	ND, Engineer, switching in yard
108	Blank	NA	NA	ND	ND
109	Blank	NA	NA	ND	ND

OSHA = Occupational Safety and Health Administration

* = OSHA regulates asbestos at 0.1 f/cc as an 8-hour time weighted average

** = OSHA regulates asbestos at 1.0 f/cc as a 30-minute Short Term Exposure Limit

NA = Not applicable

ND = None detected

F/CC = Fibers per cubic centimeter of air

Libby, Montana
Asbestos Air Sample Results
Samples were collected on April 18, 2001

Sample ID	Type	Location	Sample Duration (minutes)	Sample Results (F/CC)	Comments
101	Personal	Hart	164	<0.0043*	ND, Tamping main line @ 1318.0-1318.3
102	Personal	Arnold	282	0.0033*	Regulator on main line @ 1318.0-1318.3
103	Personal	Guthrie	Sample voided	NA	Hose came off of the pump
104	Personal	Hart	25	<0.018**	ND, Tamping main line @ 1318.0-1318.3
105	Area	Ballast regulator	50	0.0094**	Above broom outside the cab, 1318.0
106	Area	Tamper	32	<0.015**	ND, 18 inches from tamper tynes, 1318.0
107	Personal	Arnold	51	<0.0091**	ND, Regulator on main line @ 1318.0-1318.3
108	Personal	Guthrie	72	<0.0064**	ND, Walking next to tamper & regulator
1	Personal	Snyder	131	<0.0035*	ND, Welding on the main line @ 1319.2
2***	Personal	Williams	134	<0.19*	ND, Grinding main line @ 1319.2
3	Personal	Snyder	30	<0.015**	ND, Welding on the main line @ 1319.2
4	Personal	Snyder	30	<0.015**	ND, Welding on the main line @ 1319.2
5	Blank	NA	NA	ND	ND

OSHA = Occupational Safety and Health Administration

* = OSHA regulates asbestos at 0.1 f/cc as an 8-hour time-weighted average.

** = OSHA regulates asbestos at 1.0 f/cc as a 30-minute Short Term Exposure Limit.

*** = Overloaded sample was re-deposited for analysis.

NA = Not applicable

ND = None detected

F/CC = Fibers per cubic centimeter of air

Libby, Montana
Asbestos Air Sample Results
Samples were collected on April 19, 2001

Sample ID	Type	Location	Sample Duration (minutes)	Sample Results (F/CC)	Comments
1	Blank	NA	NA	ND	ND, Exposed in clean side of decon trailer
2	Area	Decon trailer	463	<0.00077*	ND, Clean room of decon trailer
3	Area	Decon trailer	460	<0.00089*	ND, Dirty room of decon trailer
4	Area	Section house	450	<0.00072*	ND, MOW office, south wall bookshelf
5	Personal	Hart	204	<0.0023*	ND, Tamping main line and #2 track in yard
6	Personal	Arnold	289	<0.0016*	Regulator; limited tamping in yard, #2 track
7	Personal	Guthrie	295	<0.0015*	ND, Walking in yard and operating regulator, NAD
8	Personal	Hart	30	<0.015**	ND, Tamping eastbound on main line @ 1315.9
9	Personal	Arnold	30	<0.015**	ND, Regulator on #2 yard track brooming westbound
10	Personal	Renshaw	30	<0.016**	ND, Shoveling gravel chips
200	Personal	Granger	69	<0.0067**	ND, Operating crane while dumping chips on yard track #2
201	Personal	Schulte	304	<0.0027*	ND, Spreading chips on yard track #2
202	Personal	Renshaw	301	<0.0015*	ND, Acting foreman spreading chips on yard track #2
203	Personal	Miller	256	<0.0018*	ND, Spreading chips on yard track #2
101	Personal	Higgins	512	<0.00088*	ND, Engineer on Libby local
102	Personal	Faller	293	<0.0015*	ND, Conductor on Libby local
103	Personal	Erickson	474	<0.001*	ND, Brakeman on Libby local
104	Personal	Faller	63	<0.0058**	ND, Throwing switches in the Libby yard
105	Personal	Higgins	41	<0.011**	ND, Operating locomotive in the Libby yard
106	Personal	Erickson	62	<0.0075**	ND, Throwing switches in the Libby yard

OSHA = Occupational Safety and Health Administration

* = OSHA regulates asbestos at 0.1 f/cc as an 8-hour time weighted average.

** = OSHA regulates asbestos at 1.0 f/cc as a 30-minute short term exposure limit.

NA = Not applicable

ND = None detected

F/CC = Fibers per cubic centimeter of air

Libby, Montana
Asbestos Air Sample Results
Samples were collected on April 20, 2001

Sample ID	Type	Location	Sample Duration (minutes)	Sample Results (F/CC)	Comments
101***	Personal	Guthrie	34	<0.98**	ND, Brooming @ 5th Street Crossing
102	Personal	Hart	70	<0.0067**	ND, Tamping in west end of yard
103	Personal	Arnold	35	<0.013**	ND, Brooming @ 5th Street Crossing
104	Area	Regulator	68	<0.0067**	ND, Outside cab door; west end yard
105	Personal	Guthrie	76	<0.0064**	ND, Brooming in the west end of the yard
106	Personal	Arnold	62	<0.0074**	ND, Brooming in the west end of the yard
107	Area	Northeast yard	64	<0.0072**	ND, East end of yard along north track
108	Blank	NA	NA	ND	ND, Field blank
109	Personal	Guthrie	64	<0.0076**	ND, Brooming/tamping east of 5th St. crossing
110	Personal	Arnold	101	<0.0046*	ND, Regulator east of 5th Street Crossing
111	Personal	Hart	66	<0.007**	ND, Tamping east of 5th Street Crossing
112	Area	Regulator	88	<0.0052*	ND, Outside regulator cab, @ 1318

OSHA = Occupational Safety and Health Administration

* = OSHA regulates asbestos at 0.1 f/cc as an 8-hour time weighted average.

** = OSHA regulates asbestos at 1.0 f/cc as a short term exposure limit.

*** = Overloaded sample was re-deposited for analysis.

NA = Not applicable

ND = None detected

F/CC = Fibers per cubic centimeter of air

Libby, Montana
Asbestos Air Sample Results
Samples were collected on April 23, 2001

Sample ID	Type	Location	Sample Duration (minutes)	Sample Results (F/CC)	Comments
1	Personal	Renshaw	123	<0.0037*	ND, Replacing ties & plates MP1319
2	Personal	Miller	122	<0.0037*	ND, Replacing ties & plates MP1319
3	Personal		119	<0.0036*	ND, Replacing ties & plates MP1319
4	Blank	NA	NA	ND	ND
101	Area	Regulator	105	<0.004*	ND, Front end of machine @ 1318 to 1310
102	Personal	Gray	113	<0.0039*	ND, Regulator operator @ 1318 to 1310
103	Personal	Guthrie	111	<0.0039*	ND, Regulator operator @ 1316, foreman
104	Area	Pick-up cab	190	<0.0022*	ND, Surfacing crew pick-up truck
105	Personal	Hart	37	<0.012**	ND, Tamper operator from 1318.1 to 1317
106	Area	Tamper, outside	60	<0.006**	ND, Left side, 2 feet from tynes
200	Area	Amtrak depot	231	<0.0038*	ND, East end of depot, 10 feet from main line
201	Area	Libby yard	231	<0.00041*	ND, NE corner of section building, outside
202	Area	Decon trailer	35	<0.0027**	ND, Dirty side, end of day decon procedures

OSHA = Occupational Safety and Health Administration

* = OSHA regulates asbestos at 0.1 f/cc as an 8-hour time weighted average.

** = OSHA regulates asbestos at 1.0 f/cc as a short term exposure limit.

NA = Not applicable

ND = None detected

F/CC = Fibers per cubic centimeter of air

Libby, Montana
Asbestos Air Sample Results
Samples were collected on April 24, 2001

Sample ID	Type	Location	Sample Duration (minutes)	Sample Result (F/CC)	Comments
101	Personal	Hart	349	<0.0013*	ND, Tamper operator
102***	Personal	Gray	378	<0.062*	ND, Regulator operator
103	Personal	Guthrie	350	<0.0011*	ND, Regulator operator, foreman
104	Area	Pick-up truck cab	390	<0.0011*	ND, Middle of front seat
105***	Area	Regulator	43	<0.53**	ND, Above broom, east end of yard
106	Personal	Gray	46	<0.0082**	ND, Regulator operator, main line in yard
107	Personal	Hart	24	<0.016**	ND, Tamper operator, main line in yard
108	Area	Regulator cab	43	0.18**	Regulating in west end of yard
109	Area	Regulator	11	0.087**	Brooming in the yard
110	Area	Tamper	47	0.031**	Near tamper tynes, in yard east of bridge,
111***	Area	Regulator cab	27	0.77**	West yard brooming
112	Area	Regulator plow	29	0.1*	Plowing in center of yard,
114	Area	Regulator	40	0.095**	Plowing west end of yard, sample near plow
115***	Area	Regulator	16	14**	Brooming center to west end of yard
116***	Area	Regulator	20	1.1**	Plowing and sweeping west end of yard
117	Area	Decon trailer	110	<0.0008*	ND, Clean room, four people showered out
118	Area	Decon trailer	18	<0.0052*	ND, Dirty room, two people showered out
119	Blank	NA	NA	ND	ND, No asbestos detected
200	Area	Amtrak depot	208	0.00064*	Regulator passed by @ 14:30
201	Area	Libby yard	194	0.0087*	South edge of parking lot
1	Personal	Renshaw	352	<0.0012*	ND, Changing switch & shoveling rock, 1319/1320
2	Personal	Miller	351	0.0013*	Changing switch & shoveling rock, 1319/1320
3	Personal	Tunison	354	<0.0013*	ND, Changing switch & shoveling rock, 1319/1320
4	Area	Section truck cab	348	<0.0014*	ND, Center of truck cab, 1319/1320
5	Personal	Miller	30	<0.013**	ND, Shoveling rock on main line
6	Personal	iger Renshaw	30	<0.015**	ND, Shoveling rock on main line

OSHA = Occupational Safety and Health Administration

* = OSHA regulates asbestos at 0.1 f/cc as an 8-hour time weighted average

** = OSHA regulates asbestos at 1.0 f/cc as a 30-minute Short Term Exposure Limit

*** = Overloaded sample was re-deposited for analysis.

NA = Not Applicable

ND = None detected

F/CC = Fibers per cubic centimeter of air

Libby, Montana
Asbestos Air Sample Results
Samples were collected on April 25, 2001

Sample ID	Type	Location	Sample Duration (minutes)	Sample Results (f/cc)	Comments
200	Area	Yard	142	0.00097*	East of section house
201	Area	Amtrak depot	67	0.0013**	NE corner, regulator was brooming
202	Area	Yard parking lot	143	0.0017*	South edge of parking lot
203	Personal	Beth Regan	47	0.036**	Walking near regulator during yard brooming
204	Area	Amtrak depot	208	0.00043*	NE corner
205	Personal	Beth Regan	200	<0.0021*	ND, Walking near tamper in yard
206	Area	Yard parking lot	123	<0.0008*	ND, North side of lot near main line
207	Area	Yard	118	<0.00078*	ND, East of section house
1	Personal	Hart	46	0.047**	Operating tamper, Trk #2, yard MP 1319
2	Area	Tamper front	42	0.011**	Front end of tamper, Trk #2, yard MP 1319
101***	Area	Regulator front	22	1.2**	Brooming east yard
102***	Area	Regulator cab	240	0.22*	Brooming east yard
103	Area	Regulator rail	25	0.41**	Brooming east yard
104***	Area	Regulator skirt	21	<1.3**	ND, Brooming east yard
105	Personal	Gray	240	0.0055*	Regulator operator brooming yard
106***	Area	Regulator front	12	0.6**	Brooming in yard
107***	Area	Regulator skirt	10	2.6**	Brooming east yard Trk#2
108	Area	Regulator rail	10	0.64**	East yard, Trk #2
109***	Area	Regulator skirt	11	9.6**	Brooming east yard, Trk #2
110***	Area	Regulator front	11	7.2**	Brooming in east yard
111	Area	Regulator rail	10	0.77**	East yard, Trk #2
112	Area	Regulator skirt	15	0.53**	Brooming east yard, Trk #2
113***	Area	Regulator front	13	3.1**	Brooming east yard, Trk #2
114	Area	Regulator rail	9	0.53**	East yard, Trk #2
115***	Area	Regulator front	32	<0.83**	ND, Brooming
116***	Area	Regulator skirt	30	<0.88**	ND, Brooming main, 1318-1319.2
117	Area	Regulator rail	33	<0.013**	ND, Brooming main, 1318-1319.2
118	Area	Regulator	30	0.016**	Brooming main in yard, 1316-1318
119	Area	Regulator front	31	<0.016**	Brooming main 1316-1318
120	Area	Regulator rail	29	<0.015**	ND, Brooming 1316-1318
121	Area	Regulator rail	20	0.35**	Plowing Trk#2, east yard
122	Area	Regulator skirt	20	0.53**	ND, Plowing Trk #2, east yard
123	Area	Regulator front	20	0.19**	Plowing Trk #2, east yard
124***	Personal	George Gray	27	2.6**	Brooming yard, Trk #2
125	Blank	NA	NA	ND	ND

OSHA = Occupational Safety and Health Administration

* = OSHA regulates asbestos at 0.1 f/cc as an 8-hour time weighted average

** = OSHA regulates asbestos at 1.0 f/cc as a 30-minute Short Term Exposure Limit

*** = Overloaded sample was re-deposited for analysis

NA = Not applicable

ND = None detected

Libby, Montana
Asbestos Air Sample Results
Samples were collected on April 26, 2001

Sample ID	Type	Location	Sample Duration (minutes)	Sample Results (F/CC)	Comments
1	Personal	Renshaw	250	<0.0015*	ND, Behind tamper on main line MP 1319
2	Personal	Miller	250	<0.0019*	ND, Behind tamper on main line MP 1319
3	Personal	Renshaw	72	<0.006**	ND, Hand tamping on main line MP1319
4	Area	SectionTruck cab	263	<0.0017*	ND, Center of cab
5	Area	Tamper line	68	<0.0061**	ND, Near line of tamper
200	Area	Tamper cab	136	<0.0028*	ND, Tamping on main line, MP 1319
201	Personal	Hart	315	<0.0013*	ND, Tamper operator tamping MP 1319
101	Personal	Gray	294	0.0043*	Regulator operator main line and yard
102	Area	Regulator cab	89	0.015**	Plowing/brooming main line, yard track #5
103	Personal	Gray	95	0.0046**	Regulator operator east main line and yard
104	Area	Tamper line	83	<0.0053**	ND, Tamping on main line, MP 1319
105	Personal	Hart	81	<0.0057**	ND, Tamping on main line, MP 1319
106	Personal	Guthrie	90	<0.0049**	ND, Foreman surfacing crew,main line/east yard
107	Area	Regulator skirt	22	<0.018**	ND, Brooming/plowing east yard
108	Area	Regulator rail	22	0.021**	Brooming/plowing east yard
109	Area	Regulator front	20	<0.022**	ND, Brooming/plowing east yard
110	Area	Regulator front	43	0.01**	Brooming/plowing main line in east yard
111	Area	Regulator rail	43	<0.011**	ND, Brooming/plowing main line in east yard
112	Area	Regulator skirt	10	0.04**	Brooming/plowing main line in east yard
113	Area	Regulator cab	59	<0.0073**	ND, Plowed,broomed Trk #5,bridge to east end
114	Area	Regulator rail	25	0.018**	Plowing Trk #5 in east yard
115***	Area	Regulator skirt	26	<0.85**	ND, Plow Trk#5 east yard,no asbestos detected
116	Area	Regulator front	26	0.017**	Plowing Trk #5 in east yard
117	Area	Regulator front	20	0.044**	Plowing/brooming Trk #5 in east yard
118	Area	Regulator skirt	21	0.019**	Plowing/brooming Trk #5 in east yard
119	Area	Regulator rail	21	<0.022**	ND, Plowing/brooming Trk #5 in east yard
120	Area	Tamper line	24	<0.018**	ND, Tamper not operating, TrK #5, east yard
121	Area	Surface truck cab	321	<0.0014*	ND, East yard switch and along main line
122	Area	Decon-trailer	45	0.0021**	Two people showered out during this sample
123	Blank	NA	NA	ND	ND

OSHA = Occupational Safety and Health Administration

* = OSHA regulates asbestos at 0.1 f/cc as an 8-hour time weighted average

** = OSHA regulates asbestos at 1.0 f/cc as a 30-minute Short Term Exposure Limit

*** = Overloaded sample was re-deposited for analysis

NA = Not applicable

ND = None detected

F/CC = Fibers per cubic centimeter of air

Libby, Montana
Asbestos Air Sample Results
Samples were collected on May 16, 2001

Sample ID	Type	Location	Sample Duration (minutes)	Sample Results (F/CC)	Comments
1	Personal	Renshaw	260	<0.047*	ND, Operating loader along main-line, MP 1314-1316
2	Area		61	<0.0072**	ND, Right headlight, MP 1314-1315, south side
3	Area		62	<0.0072**	ND, Loader cab, MP 1314-1315, south side
4	Area		61	0.0071**	Right railing, MP 1314-1315, south side
5	Personal	Mitchell	259	<0.0017*	ND, MP1314-1316 both sides of main, behind loader
6	Area		45	<0.0098**	ND, Loader cab, MP 1314-1315, north side
7	Area		42	<0.011**	ND, Left headlight, MP 1314-1315, north side
8	Area		36	<0.012**	ND, Right railing, MP 1314-1315, north side
9	Area		75	<0.0059**	Loader cab, MP1314-1316, north side
10	Area		74	<0.006**	ND, Left headlight, MP 1314-1316, north side
11	Area		77	<0.0056**	ND, Right railing, MP 1314-1316, north side
12	Area		57	<0.0077**	ND, Left headlight, MP 1315-1316, south side
13	Area		57	<0.0078**	ND, Loader cab, MP 1315-1316, south side
14	Area		57	<0.0076**	ND, Right railing, MP 1315-1316, south side
15	Blank		NA	ND	ND Field blank
16	Blank		NA	ND	ND Field blank

OSHA = Occupational Safety and Health Administration

* = OSHA regulates asbestos at 0.1 f/cc as an 8-hour time weighted average.

** = OSHA regulates asbestos at 1.0 f/cc as a short term exposure limit.

NA = Not applicable

ND = None detected

F/CC = Fibers per cubic centimeter of air

Libby, Montana
Asbestos Air Sample Results
Samples were collected on May 17, 2001

Sample ID	Type	Location	Sample Duration (minutes)	Sample Results (F/CC)	Comments
1	Personal	Renshaw	126	<0.0036*	ND, Operating loader along main-line
2	Area	Loader	36	<0.34**	ND, Loader cab, MP 1315.4 - 1316.0
3	Area	Loader	35	<0.043**	ND, Left headlight, MP 1315.4 - 1316.0
4	Area	Loader	34	0.013**	Right railing, MP 1315.4 - 1316.0
5	Personal	Mark Mitchell	120	<0.0036*	ND, Following loader in pick-up truck
6	Area	Loader	56	<0.008**	ND, Right railing, MP 1316.6 - 1317.2
7	Area	Loader	54	<0.0081**	ND, Left headlight, MP 1316.6 - 1317.2
8	Area	Loader	53	<0.0084**	ND, Cab, MP 1316.6 - 1317.2
9	Personal	Renshaw	133	0.092*	Operating loader from 1317.1 to 1318.1
10	Area	Loader	85	<0.0052**	ND, Right railing, MP 1317.1 - 1318.1
11	Area	Loader	83	<0.0052**	ND, Left headlight, MP 1317.1 - 1318.1
12	Area	Loader	80	<0.0056**	ND, Cab, MP 1317.1 - 1318.1
13	Area	Loader	21	<0.021**	ND, Right railing, 5th St. Bridge - 1318.8
14	Area	Loader	21	<0.021**	ND, Left headlight, 5th St. Bridge - 1318.8
15	Area	Loader	21	<0.021**	ND, Cab, 5th St. Bridge - 1318.8
16	Blank	NA	NA	ND	ND, Field blank

OSHA = Occupational Safety and Health Administration

* = OSHA regulates asbestos at 0.1 f/cc as an 8-hour time weighted average.

** = OSHA regulates asbestos at 1.0 f/cc as a short term exposure limit.

NA = Not applicable

ND = None detected

F/CC = Fibers per cubic centimeter of air

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Robert Erickson
BNSF Railway
500 Depot Street, 2nd Floor
Whitefish, MT 59937

Employee #:

Dear Mr. Erickson

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated.

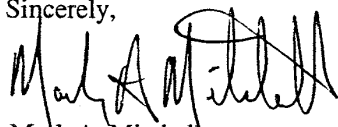
This letter summarizes the results of the personal asbestos air monitoring that was collected on you on April 19, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the sample that was collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April 17, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,



Mark A. Mitchell

Attachments: Table of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Rico Montini
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Rico Montini
BNSF Railway Trainmaster
500 Depot Street, 2nd Floor
Whitefish, MT 59937

Dear Mr. Montini:

This letter summarizes the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated.

The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area. The results of the monitoring indicate that your employees were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Several area samples collected in April exceeded the OSHA STEL of 1.0 f/cc. These samples were collected on the ballast regulator while it was performing brooming activities within the Libby Yard. My recommendation is to keep all BNSF MOW personnel out of the Libby Yard to the extent possible. If BNSF MOW employees are to work in the yard, then reference the attached letter dated May 17, 2001 as to the appropriate level of personal protective equipment and appropriate decontamination procedures for their particular work activities. As for BNSF TEY personnel, their activities did not produce any elevated fiber levels while performing their duties working the Libby Local.

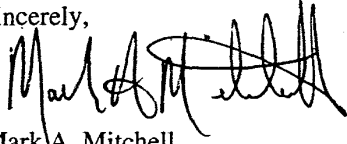
Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that your employees should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that they may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

I am waiting for the weather to dry out prior to returning for another week of air monitoring MOW activities exclusively on the main-line.

BNSFih1 dot

Feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark A. Mitchell', with a stylized, cursive script.

Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Arne Olson
BNSF Railway Roadmaster
P.O. Box 789
Libby, MT 59923

Dear Mr. Olson:

This letter summarizes the air monitoring study that was conducted in April and May of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your employee's normal work routines was a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of their individual work tasks.

The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area. The results of the monitoring indicate that your employees were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, with the exception of George Gray, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc. Mr. Gray's STEL exposure did exceed the OSHA 30-minute limit however; these air concentrations did not exceed the maximum use concentration for the type of respirator that he was wearing (powered air-purifying respirator) when the sample was collected on him.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that your employees should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that they may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Several area samples collected in April exceeded the OSHA STEL of 1.0 f/cc. These samples were collected on the ballast regulator while it was performing brooming activities within the Libby Yard. My recommendation is to keep all BNSF MOW personnel out of the Libby Yard to

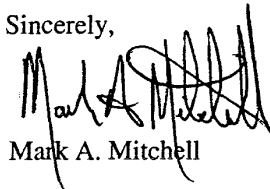
BNSFh1 dot

the extent possible. If BNSF MOW employees are to work in the yard, then reference the attached letter dated May 17, 2001 as to the appropriate level of personal protective equipment and appropriate decontamination procedures for their particular work activities.

I am waiting for the weather to dry out prior to returning for another week of air monitoring activities exclusively on the main-line. Please keep me posted as to what the weather conditions are like and I will make my plans accordingly.

Feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,



Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Michael Higgins
BNSF Railway
500 Depot Street, 2nd Floor
Whitefish, MT 59937

Employee #:

Dear Mr. Higgins:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated.

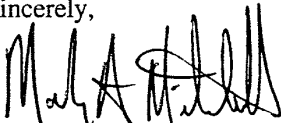
This letter summarizes the results of the personal asbestos air monitoring that was collected on you on April 19, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the sample that was collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April 17, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,



Mark A. Mitchell

Attachments: Table of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Rico Montini
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Donna Faller
BNSF Railway
500 Depot Street, 2nd Floor
Whitefish, MT 59937

Employee #:

Dear Mr. Faller:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated.

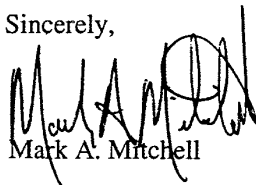
This letter summarizes the results of the personal asbestos air monitoring that was collected on you on April 19, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the sample that was collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April 17, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,



Mark A. Mitchell

Attachments: Table of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Rico Montini
Orest Dachniwshy
File



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Jim Downing
BNSF Railway
500 Depot Street, 2nd Floor
Whitefish, MT 59937

Employee #:

Dear Mr. Downing:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated.

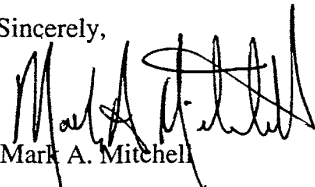
This letter summarizes the results of the personal asbestos air monitoring that was collected on you on April 17, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the sample that was collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April 17, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,



Mark A. Mitchell

Attachments: Table of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Rico Montini
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

James Whitcher
BNSF Railway
500 Depot Street, 2nd Floor
Whitefish, MT 59937

Employee #:

Dear Mr. Whitcher:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated.

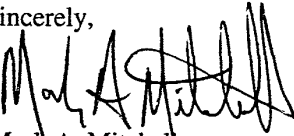
This letter summarizes the results of the personal asbestos air monitoring that was collected on you on April 17, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the sample that was collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April 17, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,



Mark A. Mitchell

Attachments: Table of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Rico Montini
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Dean Cole
BNSF Railway
500 Depot Street, 2nd Floor
Whitefish, MT 59937

Employee #:

Dear Mr. Cole:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated.

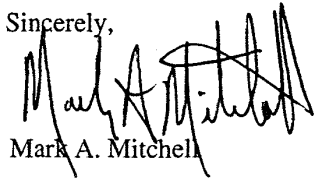
This letter summarizes the results of the personal asbestos air monitoring that was collected on you on April 17, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the sample that was collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April 17, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark A. Mitchell', with a large, stylized 'M' and 'A'.

Mark A. Mitchell

Attachments: Table of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Rico Montini
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Stuart Hart
BNSF Railway MOW Section Crew
P.O. Box 789
Libby, MT 59923

Employee #:

Dear Mr. Hart:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your normal work routines were a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of your individual work tasks.

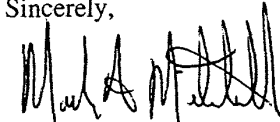
This letter summarizes the results of the personal asbestos air monitoring that was collected on you in April, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark A. Mitchell', with a stylized, cursive script.

Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Arne Olson
Orest Dachniwshy
File



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

George Gray
BNSF Railway MOW Section Crew
P.O. Box 789
Libby, MT 59923

Employee #:

Dear Mr. Gray:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your normal work routines were a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of your individual work tasks.

This letter summarizes the results of the personal asbestos air monitoring that was collected on you in April, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

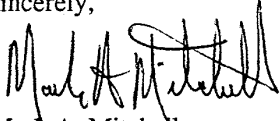
The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). However, Sample #124 collected on April 25, 2001 was collected on a short-term basis and did exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc. The air concentration as represented by this air sample as well as the area samples collected on the ballast regulator that you were operating during the study, did not exceed the maximum use concentration of the powered air-purifying respirator that you wore during the monitoring. Additionally, the decontamination procedures that you followed during the course of your work activities and at the end of each day allowed you to keep the asbestos fibers from entering your breathing zone and kept the fibers from contaminating your street clothing.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You

should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark A. Mitchell". The signature is fluid and cursive, with the first name "Mark" being the most prominent.

Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Arne Olson
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH, ROH, CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

David Arnold
BNSF Railway MOW Section Crew
P.O. Box 789
Libby, MT 59923

Employee #:

Dear Mr. Arnold:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your normal work routines were a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of your individual work tasks.

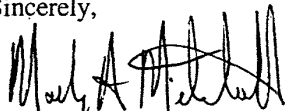
This letter summarizes the results of the personal asbestos air monitoring that was collected on you in April, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark A. Mitchell', with a large, stylized flourish at the end.

Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Arne Olson
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Joey Snyder
BNSF Railway MOW Section Crew
P.O. Box 789
Libby, MT 59923

Employee #:

Dear Mr. Snyder:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your normal work routines were a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of your individual work tasks.

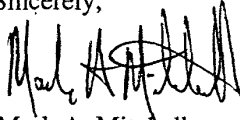
This letter summarizes the results of the personal asbestos air monitoring that was collected on you in April, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark A. Mitchell', with a stylized, overlapping loop at the end.

Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Arne Olson
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Don Smith
BNSF Railway MOW Section Crew
P.O. Box 789
Libby, MT 59923

Employee #:

Dear Mr. Smith:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your normal work routines were a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of your individual work tasks.

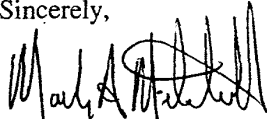
This letter summarizes the results of the personal asbestos air monitoring that was collected on you in April, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,



Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Arne Olson
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Charles Guthrie
BNSF Railway MOW Section Crew
P.O. Box 789
Libby, MT 59923

Employee #:

Dear Mr. Guthrie:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your normal work routines were a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of your individual work tasks.

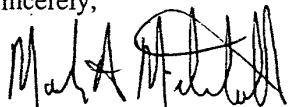
This letter summarizes the results of the personal asbestos air monitoring that was collected on you in April, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark A. Mitchell', with a large, stylized 'M' and 'A'.

Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Arne Olson
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Kerry Tunison
BNSF Railway MOW Section Crew
P.O. Box 789
Libby, MT 59923

Employee #:

Dear Mr. Tunison:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your normal work routines were a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of your individual work tasks.

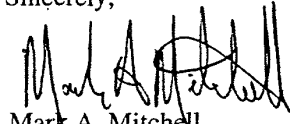
This letter summarizes the results of the personal asbestos air monitoring that was collected on you in April, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,



Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Arne Olson
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Loyde Miller
BNSF Railway MOW Section Crew
P.O. Box 789
Libby, MT 59923

Employee #:

Dear Mr. Miller:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your normal work routines were a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of your individual work tasks.

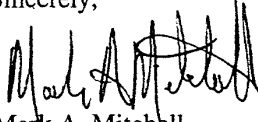
This letter summarizes the results of the personal asbestos air monitoring that was collected on you in April, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark A. Mitchell', with a stylized, cursive script.

Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Arne Olson
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Michael Williams
BNSF Railway MOW Section Crew
P.O. Box 789
Libby, MT 59923

Employee #:

Dear Mr. Williams:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your normal work routines were a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of your individual work tasks.

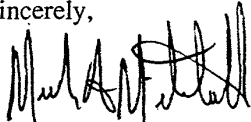
This letter summarizes the results of the personal asbestos air monitoring that was collected on you in April, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark A. Mitchell', with a stylized, cursive script.

Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Arne Olson
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Rodney Schulte
BNSF Railway MOW Section Crew
P.O. Box 789
Libby, MT 59923

Employee #:

Dear Mr. Schulte:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your normal work routines were a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of your individual work tasks.

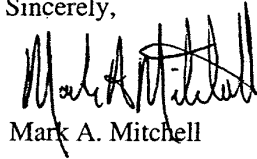
This letter summarizes the results of the personal asbestos air monitoring that was collected on you in April, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark A. Mitchell". The signature is stylized with a large, looped "M" and a long, horizontal stroke extending to the right.

Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Arne Olson
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH,ROH,CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Scott Granger
BNSF Railway MOW Section Crew
P.O. Box 789
Libby, MT 59923

Employee #:

Dear Mr. Granger:

Thank you for your participation with the air monitoring study that was conducted in April of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your normal work routines were a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of your individual work tasks.

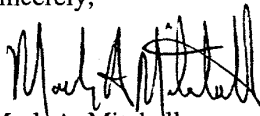
This letter summarizes the results of the personal asbestos air monitoring that was collected on you in April, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,



Mark A. Mitchell

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Arne Olson
Orest Dachniwshy
File

BNSF



MARK A. MITCHELL, CIH, ROH, CSP
Manager Industrial Hygiene

Burlington Northern Santa Fe

80 44th Avenue N.E.
Minneapolis, MN 55421

Phone: 763-782-3418
Fax: 763-782-3118
E-mail: Mark.Mitchell@BNSF.COM

June 19, 2001

Roger Renshaw
BNSF Railway MOW Section Crew
P.O. Box 789
Libby, MT 59923

Employee #:

Dear Mr. Renshaw:

Thank you for your participation with the air monitoring study that was conducted in April and May of this year at the BNSF site located in Libby, Montana. Your participation in helping me characterize employee exposures was greatly appreciated. The Libby MOW Section is to be commended for their collective effort in helping to make the arrangements to complete the air monitoring. I realize that accommodating the personal protective equipment as well as all of the decontamination procedures into your normal work routines were a challenge for each of the Section members. However, without your help and cooperation, I could not have completed the exposure characterizations of your individual work tasks.

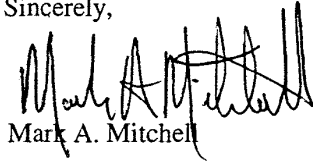
This letter summarizes the results of the personal asbestos air monitoring that was collected on you in April and May, 2001. The purpose of the air monitoring was to determine if BNSF employees were exposed to elevated levels of airborne asbestos while performing their duties in the Libby yard as well as the on the main-line track in the Libby area.

The results of the monitoring indicate that you were not exposed to airborne asbestos levels that exceeded the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time weighted average (TWA). Additionally, the samples that were collected on a short-term basis did not exceed the OSHA 30-minute Short Term Exposure Limit (STEL) of 1.0 f/cc.

Attached are tables summarizing the air monitoring results that were collected on BNSF employees involved in the April and May, 2001 airborne asbestos sampling. Additionally, attached is a letter dated May 17, 2001, that was sent from Don Cleveland, Director Industrial Hygiene, to Ray Stephens, BNSF Assistant Vice President, Seattle Service Region. This letter prescribes the appropriate level of personal protection that you should wear, as well as the appropriate type of decontamination procedures that should be followed as a function of the type of work that you may be performing while in the project area located in Libby, Montana. You should already be familiar with the contents of the letter in that these are the same protocols and procedures that were followed while I was in Libby, Montana, conducting the air monitoring.

Please feel free to contact me with any questions that you may have regarding the air monitoring results.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark A. Mitchell', with a stylized, cursive script.

Attachments: Tables of air monitoring results
May 17, 2001 letter from Don Cleveland to Ray Stephens

C: Arne Olson
Orest Dachniwshy
File

Zonolite's Expanding Plant to Close

The Zonolite plant here will soon be without an expanding plant for the first time since the vermiculite mining operation started in Libby in 1923.

Earl Lovick, resident manager of the W. R. Grace & Company's Construction Products Division here, announced this week that the expanding plant will be dismantled about Oct. 1.

Lovick said the furnace and expanding equipment in the plant building, located near the Highway 37 overpass and the Great Northern tracks, will be dismantled and shipped to one of the company's other expanding plants.

The three men now employed at the expanding plant here will be absorbed into other jobs in the firm's mining and shipping operations here, Lovick said.

The closing of the expanding plant here indirectly means a cut in employment, Lovick pointed out, since the three men being transferred to other jobs will be taking jobs that probably would have been open for three other men.

In addition, the parent firm announced last week that it is transferring Dave Robinson, expanded research engineer, to its Greenville, S. C., plant

to take on enlarged responsibility in the research field.

Robinson's transfer apparently has a bearing on the closing of the expanding plant here, Lovick indicated. He pointed out that the expanding plant here was used primarily to supply the local market with the Zonolite insulation material, to manufacture specialty products and to conduct research in the expanding of the vermiculite ore.

Lovick explained that "it simply wasn't economical to operate the expanding plant

here anymore.

He estimated that the expanding plant here processed less than 1 percent of all the ore mined from the vermiculite mine located about six miles northeast of Libby.

The insulation material for local use probably now will come from the company's expanding plant in Spokane or a plant in Great Falls that is licensed from the firm, Lovick said.

He said research on expanding the material probably will center on the Greenville plant, and that specialty

materials are now manufactured in several of the firm's expanding plants around the country.

The present expanding plant here was constructed in 1946. The furnace and other expanding equipment has been updated from time to time since then, Lovick said.

He explained that only the equipment will be dismantled and moved. The building will remain, although he said the firm has no plans for the building.

Zonolite, which was founded here, became a part of the W. R. Grace & Co. by merger in 1963

The Western News

Devoted to the Development of Libby and of Lincoln County

Volume 69—No. 23

Libby, Montana, Thursday, September 25, 1969

Price 10 Cents

Scores of Volunteers Travel from Ronan, Polson Daily to Search for River Victim

WN 9/25/69

BAGS ELK WY
bull elk he bag
killed and the
the front shou

December 1, 1983

-2-

Vermiculite
Concentrate Labels

- It was also generally agreed that a similar determination would be subject to significantly more variables at "expander" customer locations. Actual personnel exposures would depend not only on handling of Unexpanded SBO Concentrate, but also on the expanding process and dust control effectiveness.
- In either case, information (such as an M.S.D.S.) must be provided to all customers regarding the actual tremolite content of the SBO Concentrate. This is so employers can determine compliance with the standard which requires medical examinations at 0.1 fibers/cc TWA.
- Two other labelling considerations were identified: State Right-To-Know Laws and Product Liability.
- New Right-To-Know Laws have just been established and others are in development. The potential impact on labelling is not known, but is being assessed by Q. A. and Legal.
- Product Liability can influence label decisions independent of government regulations. Such decisions are business decisions based on legal, moral, and financial considerations.
- Finally, it was requested that the information gathered to date on airborne fiber level reduction, be tabulated. The attached table summarizes the information supplied by Al Crawford. It should be noted that the fiber levels are not expressed as time weighted averages since such a calculation is not possible for the test models used. The data is presented as a comparison of treated vs. untreated concentrates. In every case, airborne levels are significantly reduced when the concentrate is treated with Soybean Oil (SBO). This fact indicates a high probability of very low to nonexistent personnel exposures for "as is" end-users.


S. Venuti

SV:dm

Attachments

WRG05178070

S8020043339

0409-2

Z-TEMP. MATERIAL SAFETY DATA SHEET Page 1 of 10

MSDS PREPARED BY: Environmental Health Dept. Construction Products Div.
 W.R. Grace & Co.-Conn. W. R. Grace & Co. of Canada Ltd.
 62 Whittemore Ave. 294 Clements Rd. West
 Cambridge, MA 02140 Ajax, Ontario, L1S 3C6
 Telephone Number for Information and Emergency Response
 In USA: (617) 876-1400 In Canada: (416) 683-8561

MSDS Number: Z-TEMP. 000USA Cancels MSDS # NEM Date: 04/13/1992

SECTION 1 - PRODUCT IDENTIFICATION

Trade Names and Synonyms:

VERMICULITE CONCENTRATE/
LIBBY NON DUST SUPPRESSED

(SEE SECTION 12 FOR ADDITIONAL
PRODUCT IDENTIFICATION)

Chemical Names and Family:

Libby, Montana Vermiculite Concentrate;
Magnesium-Aluminosilicate Mineral.

Product Use:

Various Industrial Uses

Formula:

$(Mg, Ca, K, Fe^{II})_3 \cdot (Si, Al, Fe^{III})_4 O_{10} (OH)_2 \cdot 4(H_2O)$

CAS# (Chemical Abstract Service): 01318-00-9

Transportation Hazard Classification

United States DOT	Canadian Regulations
PROPER SHIPPING: Not Applicable	IDG CLASS: Nonhazardous
HAZARD CLASS: Nonhazardous	
IDENTIFICATION #: Not Applicable	
LABEL(s) REQUIRED: Not Applicable	

Surface Freight Classification:

Crude Vermiculite Ore

NPCA-HMIS Hazard Index:

- o Health: 1
 - o Flammability: 0
 - o Reactivity: 0
 - o Personal Protection: E
- (See Section VIII)

SECTION 2 - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

INGREDIENT

(Chemical Name,
CAS# & Common Name)
Respirable Crystalline
Silica (Quartz)
CAS# 14808-60-7
1305F

2
By Wt.
Typically
<1%

TOXICITY DATA LD50, LC50 etc.

(See Section IX for Exposure Limits)
No Data Available

Z-TEMP.

MATERIAL SAFETY DATA SHEET: DATA SHEET - Page 2 of 10

SECTION 2 - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION (Con't)

INGREDIENT (Chemical Name, CAS#, & Common Name)	% By Wt.	TOXICITY DATA: LD ₅₀ & LC ₅₀ (See Section IX for Exposure Limits)
Tremolite Asbestos CAS# 14567-73-8	Typically 0.3-1%	No Data Available

1306f

SECTION 3 - PHYSICAL DATA/CHEMICAL CHARACTERISTICS

<u>Boiling Point:</u> Not Applicable	<u>Specific Gravity (H₂O = 1)</u> Not Applicable
<u>Vapor Pressure (mm Hg.)</u> Not Applicable	<u>% Volatiles</u> Not Applicable
<u>Vapor Density (AIR = 1)</u> Not Applicable	<u>Evaporation Rate (Butyl Acetate = 1)</u> Not Applicable
<u>Solubility in Water:</u> None	<u>pH</u> Not Applicable
<u>Bulk Density (#/cu. ft):</u> 50-65	
<u>Appearance and Odor:</u> Dark greenish brown to golden brown in color. Flake shaped. No odor.	
<u>Odor Threshold:</u> Unknown	

Z-TEMP.

MATERIAL SAFETY DATA SHEET DATA SHEET Page 3 of 10

SECTION 4 - FIRE AND EXPLOSION HAZARD DATAFlash Point: NoneFlammable Limits:Method Used: Not Applicable

LEL N.A.

UEL N.A.

N.F.P.A. Rating: Not ApplicableExtinguishing Media

Not Applicable

Special Fire Fighting Procedures

Not Applicable

Unusual Fire and Explosion Hazards

Not Applicable

SECTION 5 - REACTIVITY DATAStable under normal conditions (yes or no): YESConditions or Materials to avoid (which may react or cause instability):

None Known

Hazardous Decomposition or Byproducts:

None Known

Hazardous Polymerization:

Will not occur

Conditions to Avoid:

None Known

SECTION 6 - HEALTH HAZARD DATA & TOXICOLOGICAL PROPERTIES(Include all known acute and chronic effects, signs, and symptoms of exposure and medical conditions generally aggravated by exposure)Routes of Exposure:Inhalation:

Vermiculite dust released in handling, expanding, and subsequent end use may cause symptoms typical of nuisance dusts including coughing, sneezing, and minor respiratory irritation. Medical conditions which may be aggravated by inhalation of dust include pre-existing upper respiratory and lung disease. Airborne dust may also contain asbestiform tremolite fibers and Respirable Crystalline Silica. See information below regarding carcinogenicity and long-term health effects.

Z-TEMP.

MATERIAL SAFETY DATA SHEET Page 4 of 10

SECTION 6 - HEALTH HAZARD DATA & TOXICOLOGICAL PROPERTIES (Con't)

(Include all known acute and chronic effects, signs, and symptoms of exposure and medical conditions generally aggravated by exposure)

Skin and Eye:

Direct eye contact may cause minor physical or mechanical irritation.
Skin contact not expected to cause any harmful effects.

Ingestion:

Adverse health effects are not expected as a result of ingestion.

Carcinogenicity According to NTP, IARC and OSHA:

Operations involving the use and/or expansion of Vermiculite Concentrate may create atmospheres containing tremolite fibers, a form of asbestos. According to NTP, IARC and OSHA 29 CFR 1910.0001 (Appendix 6), asbestos fibers "can cause disabling respiratory disease and various types of disease if the fibers are inhaled." Risk of disease is significantly increased by smoking. Ingestion of fibers has also been associated with increased risk of disease. Diseases associated with asbestos fiber include: Lung Cancer, Asbestosis, Mesothelioma, and cancer of the stomach and colon. "Mesothelioma is a rare cancer of the thin membrane lining of the chest and abdomen. Symptoms of mesothelioma include shortness of breath and pain in the walls of the chest and/or abdomen."

In addition, atmospheres containing Respirable Crystalline Silica may be created. Crystalline Silica has been classified as a probable human carcinogen by IARC, a unit of the World Health Organization. NTP has included Silica Crystalline (respirable) as a substance reasonably anticipated to be a carcinogen based on sufficient animal and limited human data. See exposure limits specified in Section 9 of this MSDS. Long-term inhalation of Respirable Crystalline Silica may cause lung disease including silicosis and lung cancer.

SECTION 7 - EMERGENCY AND FIRST AID PROCEDURES

In case of EYE contact, do not rub eyes. Flush with plenty of water while holding eyelids apart. If irritation, blinking or tearing occur and persist, consult a physician.

Adverse health effects are not expected if SWALLOWED. Consult a physician if symptoms develop.

If INHALED, get fresh air. If symptoms of irritation occur and persist, consult a physician.

Z-TEMP.

Z-TEMP.

MATERIAL SAFETY DATA SHEET DATA SHEET Page 5 of 10 Page 6 of

SECTION 8 - PREVENTIVE & CONTROL MEASURES**Warning Statements:****DANGER!**

- ... Libby, Montana Vermiculite Concentrate, CAS# 1318-00-9.
- ... Contains Asbestiform Tremolite CAS# 14567-73-8 and Total and Respirable Crystalline Silica (Quartz) CAS# 14808-60-7.
- ... Avoid creating dust.
- ... Cancer, silicosis and other lung disease hazard.
- ... Inhalation of Vermiculite Concentrate Dust (CAS# 1318-00-9) may cause slight physical irritation of the respiratory tract resulting in coughing or sneezing.
- ... Dust may cause slight physical or mechanical irritation to eyes.

Precautionary Measures:

- ... Avoid contact with eyes. (Wear goggles if necessary.)
- ... Avoid inhalation of airborne dust. (See MSDS Section 8 for information regarding respirators and ventilation.)
- ... Equip hoppers with dust covers where applicable.
- ... For professional use only. Keep out of children's reach.

Respiratory Protection:

A NIOSH Type TC-21C-XXX dust respirator is recommended to control exposure to vermiculite and Respirable Crystalline Silica (Quartz) dust within the limits prescribed in Section 9 of this MSDS. If handling results in exposure to tremolite fiber in excess of the Permissible Exposure Level, respiratory protection must be provided in accordance with CFR 1910.0001, Paragraph (g) - Respiratory Protection.

Ventilation:

- Local Exhaust: Recommended
- Mechanical: Recommended
- Special: Refer to 29 CFR 1910.1001 (f) Methods of Compliance.
- Other: Refer to 29 CFR 1910.1001 (f) Methods of Compliance.

Z-TEMP.

MATERIAL SAFETY DATA SHEET Page 6 of 10

SECTION 8 - PREVENTIVE & CONTROL MEASURES (Con't)

Skin Protection:

Not generally required.

Eye Protection:

Goggles recommended when dust is created.

Other Protective Clothing or Equipment:

Not generally required.

Work/Hygienic Practices:

SUPPLEMENTAL INFORMATION

Vermiculite Concentrate

Vermiculite:

Is processed from ore mined at the Libby, Montana mining operation, where W. R. Grace & Co. maintains high quality standards. The natural geologic formation at Libby contains other mineral components, in addition to vermiculite. One of these is asbestiform tremolite (defined as asbestos by OSHA). Grace's mining and milling process significantly reduces the tremolite content in vermiculite concentrate. However, it should be noted that there exists the potential for the release of airborne fiber. It should be noted that airborne fiber is released during expansion.

The United States Occupational Safety and Health Administration (OSHA) has established regulations regarding occupational exposure to airborne asbestos fibers including tremolite (29 CFR 1910.1001). OSHA regulations include a permissible exposure level (PEL) of 0.2 fibers/cc (8 hr. time weighted average), an excursion limit of 1.0 fiber/cc (for a 30 minute exposure) and an action level of 0.1 fibers/cc (8 hr. time weighted average).

Paragraph (d) (2) of the standard requires that "each employer who has a workplace or work operation covered by this standard ... shall perform initial monitoring of employees who are or may reasonably be expected to be exposed to airborne concentrations at or above the action level and/or the excursion limit." Although we believe that exposures below these limits can be achieved through proper handling and/or engineering control, we recognize that fiber release is possible. Accordingly, we recommend that users of this product familiarize themselves with the requirement of 29 CFR 1910.1001 and perform the initial monitoring to determine what steps, if any, are required to comply with the rest of the standard.

Z-TEMP.

MATERIAL SAFETY DATA SHEET ~~XXXX~~ ~~XXXX~~, Page 7 of 10 ~~Page 7 of 10~~

You should also be aware that Grace treats our standard Libby expanded vermiculite products with a water binder. Objective data collected in a variety of end use applications of the product, clearly indicates the addition of water to vermiculite can control the release of airborne fiber concentration below the excursion limit and the action level. Further information regarding this is available upon request.

Respirable
Crystalline
Silica(Quartz)

Section 2 of this MSDS indicates that this product can contain Respirable Crystalline Silica (Quartz) at <1% by weight. Crystalline Silica (Quartz) is a naturally occurring mineral that is commonly contained in materials that are mined from the earth's surface such as sand, limestone, clay and gypsum. Total Crystalline Silica (Quartz) is comprised of respirable and nonrespirable size particles. The health hazards associated with quartz are tied to the respirable size particles. We believe that the quartz present in vermiculite is predominately nonrespirable. However, handling and processing may create respirable particles. Therefore, potential exposures must be considered.

1307f

Z-TEMP.

MATERIAL SAFETY DATA SHEET

Page 8 of 10

SECTION 9 - HAZARDOUS INGREDIENTS EXPOSURE LIMITS - U.S. Only

INGREDIENT:	Exposure Limits		
	OSHA	ACGIH	OTHER
ASBESTIFORM TREXOLITE CAS# 14567-73-8	0.2 fiber/cc 8hr.TWA 0.1 fiber/cc (Action Limit) 1.0 30 Min.Excur.Lim	2.0 fibers/cc TWA	—
NUISANCE PARTICULATES CAS# N/A	PEL: Total: 15 mg/m ³ Respirable: 5mg/m ³	TLV: Total: 10 mg/m ³	None Established
QUARTZ (CRYST. SILICA) CAS# 14808-60-7	PEL/TWA 0.1mg/m ³ as respirable dust	TLV/TWA 0.1mg/m ³ as respirable dust	NIOSH 0.05 mg/m ³ as respirable dust

Z-TEMP

MATERIAL SAFETY DATA SHEET

Page 9 of 10

SECTION 10 - SPILL & DISPOSAL INFORMATION - U.S. Only

Libby Vermiculite concentrate may contain up to 1.0% tremolite asbestos which is a hazardous substance according to Section 307 of the Clean Air Act. Spills of asbestos equal to or greater than 1.0 lb. are reportable. Therefore, spills of concentrate equal to or greater than the Reportable Quantity (R.Q. = 100 lbs.) must be reported to the National Response Center immediately at 800-424-8802. Spill reporting requirements vary by region. Consult MSDS Section 11 and applicable state and local regulations.

If spilled, observe the handling procedures recommended above to avoid creating dust when cleaning up material. Remove spilled material for disposal or recycling.

According to US EPA (40 CFR 261.3), waste of this product is not defined as hazardous. Dispose of all waste in accordance with federal, state and local regulations.

SECTION 11 - GOVERNMENT REPORTING INFORMATION - U. S. Only**SARA Title III Reporting Information****Tier I & II Hazard Categories:**

DELAYED-CHRONIC

IMMEDIATE-ACUTE

Contains Extremely Hazardous-SARA III Section 302 Ingredient:

NO

Comments:**Contains Toxic Chemical Release-SARA III Section 313 Ingredient:** YES**Comments:** Contains up to 1% Tremolite CAS# 14567-73-8 which appears as Asbestos CAS# 1332-21-4 on the 313 list.**Other Government Reporting Requirements:**

In MASSACHUSETTS, spills equal to or greater than the RQ must also be reported to the DEP.

In NEW YORK, spills equal to or greater than the RQ must also be reported to the DEC.

In PENNSYLVANIA, asbestos is listed as both an environmental and a special hazard.

Z-TEMP

MATERIAL SAFETY DATA SHEET

Page 10 of 10

SECTION 11 - GOVERNMENT REPORTING INFORMATION - U. S. Only (Con't)

Non-Hazardous Ingredient Disclosure:

SECTION 12 - PRODUCT IDENTIFICATION/TRADENAME ADDENDUM

The information contained in this Material Safety Data Sheet is applicable to the following products:

VERMICULITE CONCENTRATE/LIBBY NON DUST SUPPRESSED

"THE DATA INCLUDED HEREIN ARE PRESENTED ACCORDING TO W. R. GRACE & CO.-CONN'S PRACTICES CURRENT AT THE TIME OF PREPARATION HEREOF, ARE MADE AVAILABLE SOLELY FOR THE CONSIDERATION, INVESTIGATION AND VERIFICATION OF THE ORIGINAL RECIPIENTS HEREOF AND DO NOT CONSTITUTE A REPRESENTATION OR WARRANTY FOR WHICH GRACE ASSUMES LEGAL RESPONSIBILITY. IT IS THE RESPONSIBILITY OF A RECIPIENT OF THIS DATA TO REMAIN CURRENTLY INFORMED ON CHEMICAL HAZARD INFORMATION, TO DESIGN AND UPDATE ITS OWN PROGRAM AND TO COMPLY WITH ALL NATIONAL, FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS APPLICABLE TO SAFETY, OCCUPATIONAL HEALTH, RIGHT-TO-KNOW AND ENVIRONMENTAL PROTECTION."

AUG 13 1982

DRAFT

DISPOSITION PAPER
FOR
ASBESTOS-CONTAMINATED VERMICULITE

AUGUST 1982

CHEMICAL CONTROL DIVISION
OFFICE OF TOXIC SUBSTANCES

PP DGT-42



TABLE OF CONTENTS

PURPOSE	
I. CONCLUSIONS AND RECOMMENDATIONS	4
Conclusions	4
Recommendations	5
II. BACKGROUND	7
Introduction	7
Basis for Concern	9
III. HEALTH EFFECTS	11
Asbestos	11
Vermiculite	12
Risk Evaluation	14
IV. FEDERAL AND STATE AGENCY AUTHORITIES AND ACTIVITIES	15
V. OTS ACTIVITIES	18
Initial Activities	18
Recent Activities	20
A. Monitoring Study	20
B. Exposure Assessment	25
Table 1	28
REFERENCES	29-33

PURPOSE

The objective of this document is to provide information enabling the Director of the Office of Toxic Substances to decide what course of action to take concerning vermiculite.

-4-

I. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. There are significant adverse health effects associated with past occupational exposures to asbestos-contaminated vermiculite, although current levels of workers' exposure are reportedly lower than years ago.
2. It is reasonable to assume that these adverse health effects were mainly caused by inhalation of asbestos, a contaminant in vermiculite.
3. About 350,000 tons of vermiculite are mined and distributed in commerce annually in the U.S. Thus, even at low levels of contamination, the amount of asbestos released to the environment could be significant.
4. The demand for vermiculite may increase significantly, due to the growing need for home-insulating materials to replace urea-formaldehyde resin.
5. Viable substitutes are available for most uses of vermiculite, according to a recent OTS contract study. Also, it appears that the level of asbestos contamination in vermiculite can be significantly reduced from current levels through engineering controls.

0315-04

-5-

6. Although occupational exposures fall under existing Federal regulations affecting asbestos in the workplace, there is no regulatory control of consumer uses.
7. Some consumer uses of vermiculite, particularly the insulation of attics, may pose a significant health hazard, although actual exposure measurements are currently lacking to confirm this.
8. The public is generally unaware that vermiculite is likely to be contaminated with asbestos.
9. The Toxic Substances Control Act provides the only Federal authority to regulate asbestos-contaminated vermiculite throughout its life cycle.
10. Monitoring low levels of asbestos in vermiculite presents some technical problems in sampling, analysis, and reproducibility. There is no scientific consensus on acceptable laboratory protocols for compliance monitoring.

Recommendations

1. Perform a study to measure the level of consumer exposure to asbestos in selected vermiculite products. The Mt. Sinai School of Medicine has proposed such a study, which would

0315-05

-6-

include the analysis of 40-50 samples of various vermiculite products (e.g., loosefill insulation for roofs and walls, soil additives, and packaging materials). Also, the levels of airborne asbestos concentrations to which consumers might be exposed in the use of these 40-50 vermiculite products would be determined (see attached research plan). This proposed study would cost about \$102,000 and would be coordinated with the Consumer Product Safety Commission.

2. If the study proposed in Recommendation #1 confirms that there is a health concern to consumers, negotiate a voluntary program of engineering controls with the three domestic vermiculite mining and processing companies to reduce the level of asbestos contamination in vermiculite.
3. Again, if the consumer exposure study confirms that there is a health concern, negotiate voluntary labeling of vermiculite as to level of asbestos content and recommended precautions for product use.
4. Use the newly established Federal Asbestos Task Force to disseminate information on the various Federal agency activities concerning vermiculite.
5. Recommend to ORD that uncontaminated vermiculite be tested for biological activity.

-25-

B. Exposure Assessment

More recently, in February 1982, Versar, Inc., under contract to OTS, prepared an interim final exposure assessment for asbestos-contaminated vermiculite throughout most of its life cycle.²² Human exposures to vermiculite were estimated during mining and milling, processing, transporting, and during commercial and consumer uses. Sources of information included data found in the vermiculite industry records, information in the PRL-1 report, monitoring data obtained by EPA, and a number of other sources.

Exposure to asbestos in asbestos-contaminated vermiculite occurs primarily through inhalation; ingestion and dermal absorption seem to be insignificant routes, although ingestion of asbestos may follow initial inhalation. The exposure assessment was designed to provide inhalation exposure estimates for use in a risk analysis and subsequent regulatory action, if indicated. The focus was on occupational and consumer exposures. Some high-exposure occupational groups identified included rail workers transporting raw ore, miners, and exfoliators. These three types of occupational exposure were estimated at levels of 4.0×10^{11} fibers per year, 1.7×10^{10} fibers per year, and 8.3×10^8 fibers per year, respectively. These exposures affect a relatively small population. A much larger number of persons may inhale asbestos during trade or consumer use of vermiculite products, but are expected to receive lower exposures.



DRAFT 11/4/01

SETTLEMENT NEGOTIATION DOCUMENT

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION VIII

IN THE MATTER OF:

Burlington Northern Santa Fe Property
Libby Asbestos Site
Libby, Montana

Burlington Northern Santa Fe Railroad,
Respondent

ADMINISTRATIVE ORDER ON
CONSENT FOR REMOVAL ACTION

U.S. EPA Region VIII
CERCLA Docket No. _____

Proceeding Under Sections 104, 106(a), 107
and 122 of the Comprehensive
Environmental Response, Compensation,
and Liability Act, as amended, 42 U.S.C. §§
9604, 9606(a), 9607 and 9622

11. EPA's toxicologist has analyzed the data resulting from EPA's investigations and has concluded that the presence of the asbestos at the Site may present an imminent and substantial endangerment. The Assistant Regional Administrator for the Office of Ecosystem Protection and Remediation has determined that the presence of the asbestos at the Site may present an imminent and substantial endangerment in the Action Memorandum dated August 17, 2001. The data and documents supporting this finding, including the Action Memorandum, are contained in an administrative record dated _____, and its supplement dated _____. The administrative record and its supplement are incorporated by reference into this Order.

12. Respondent owns a railyard within the Site. Respondent recently implemented its own investigations to determine if yard activities would entrain asbestos fibers into the air; the results confirmed that such activities can entrain high levels of asbestos fibers.

13. EPA and Respondent agree that further sampling and analysis is necessary to determine if response actions are necessary at the Property.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

14. Based on the Findings of Fact set forth above, and the Administrative Record supporting this removal action, EPA has determined that:

a. The Libby Asbestos Site, including the Property, is a "facility" as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

b. The contamination found at the Site and at the Property, as identified in the Findings of Fact above, includes a "hazardous substance" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

c. The Respondent is a "person" as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

d. The Respondent is a responsible party under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), and is liable for performance of response action and for response costs incurred and to be incurred at the Property. Respondent is the "owner" of the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(1) of CERCLA, 42 U.S.C. § 9607(a)(1).

e. The conditions described in Paragraph 10 the Findings of Fact above constitute an actual or threatened "release" of a hazardous substance from the facility as defined by Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

f. The response action required by this Order is necessary to protect the public health, welfare, or the environment and, if carried out in compliance with the terms of this Order, will be considered consistent with the NCP, as provided in Section 300.700(c)(3)(ii) of the NCP.

ORIGINAL

THOMAS L. SANSONETTI
Assistant Attorney General, ENRD
DAVID M. UHLMANN
Chief, Environmental Crimes Section
KEVIN M. CASSIDY
Trial Attorney
Environmental Crimes Section

FILED
MISSOULA, MT

2025 FEB 7 PM 1 40

BY *C. Dahley*
DEPUTY CLERK

WILLIAM W. MERCER
United States Attorney
KRIS A. MCLEAN
Assistant U.S. Attorney
U.S. Attorney's Office
P.O. Box 8329
Missoula, MT 59807
105 E. Pine, 2nd Floor
Missoula, MT 59802
Phone: (406) 542-8851
FAX: (406) 542-1476

ATTORNEY FOR PLAINTIFF
UNITED STATES OF AMERICA

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF MONTANA

MISSOULA DIVISION

UNITED STATES OF AMERICA, Plaintiff, vs. W.R. GRACE, ALAN R. STRINGER, HENRY A. ESCHENBACH, JACK W. WOLTER, WILLIAM J. McCAIG, ROBERT J. BETTACCHI, O. MARIO FAVORITO, ROBERT C. WALSH v 8 Defendants.	CR 05 - 07 -M-DWM <u>INDICTMENT</u> CONSPIRACY (Count I) Title 18 U.S.C. §371 (Penalty: Five years imprisonment, \$250,000 fine, and three years supervised release; \$1,000,000 fine per violation for organization) CLEAN AIR ACT VIOLATIONS (Counts II, III, IV) Title 42 U.S.C. § 7413(c)(5)(A) (Penalty: Fifteen years imprisonment, \$250,000 fine, and three years supervised release; \$1,000,000 fine per violation for organization)
--	---

	<p>WIRE FRAUD (Counts V, VI) 18 U.S.C. §§ 1343, 2 (Penalty: Ten years imprisonment, \$250,000 fine, and three years supervised release)</p> <p>OBSTRUCTION OF JUSTICE (Counts VII, VIII, IX, X) 18 U.S.C. §§ 1505, 2 (Penalty: Five years imprisonment, \$250,000 fine, and three years supervised release)</p>
--	---

THE GRAND JURY CHARGES:

INTRODUCTION

A. BACKGROUND

At all times material to this Indictment:

1. In the late 1800s, gold miners discovered a significant body of vermiculite ore in an area located in the mountains approximately seven miles northeast of the town of Libby, Montana (the "Libby Mine").
2. Vermiculite is a mineral that expands, or pops, at high temperatures in an "expansion" or "exfoliation" process.
3. Expanded vermiculite that originated at the Libby Mine had many uses, including as an attic insulation (marketed as "Zonolite Attic Insulation"), as an ingredient in fireproofing products (marketed as "Monokote"), as an ingredient in masonry fill, and as an additive in potting soils and fertilizers.
4. The vermiculite deposits at the Libby Mine were contaminated with amphibole asbestos. The amphibole asbestos found at the Libby Mine is composed of a family of closely related minerals including tremolite, winchite, richterite, actinolite

and others. This amphibole asbestos has been commonly called "tremolite" and, for the purposes of this Indictment, it will be referred to as "tremolite," "tremolite asbestos" and "amphibole asbestos."

5. On or about 1939, the Zonolite Company (originally known as Universal Zonolite Insulation Company) was formed to mine and process vermiculite from the ore deposit at the Libby Mine.
6. Pursuant to the Agreement and Plan of Reorganization dated January 17, 1963, between W.R. Grace & Co., a Connecticut corporation, and the Zonolite Company ("Zonolite Agreement"), W.R. Grace & Co. acquired "substantially all of the properties and assets of Zonolite" under the terms and conditions contained in that agreement.
7. The employees of the Zonolite Company remained at the mine and processing facilities as employees of W.R. Grace & Co.
8. W.R. Grace & Co. operated the Libby Mine until on or about 1992.
9. W.R. Grace & Co. acquired the rights to the name "Zonolite" as part of the transaction with the Zonolite Company and continued to manufacture and sell Zonolite's product line, including vermiculite concentrate, expanded vermiculite, and Zonolite Attic Insulation.
10. In 1988, W.R. Grace & Co., the same Connecticut corporation that entered into the Zonolite Agreement, changed its name to W.R. Grace & Co. - Conn. as part of a corporate reorganization, and became a subsidiary of a newly-created New York corporation named W.R. Grace & Co. In 1998, W.R. Grace & Co., a

Delaware corporation, was incorporated. W.R. Grace & Co. - Conn., became a wholly owned subsidiary of the Delaware corporation.

11. For the purposes of this Indictment, "W.R. GRACE" refers to W.R. Grace & Co., a Connecticut corporation, both before and after it changed its name to W.R. Grace & Co.-Conn. in 1988.
12. As part of its operations, defendant W.R. GRACE mined and milled vermiculite ore at the Libby Mine. The milled vermiculite ore was known as "vermiculite concentrate."
13. As part of its operations, defendant W.R. GRACE disposed of mining waste and mill tailings (a waste product of the milling process) at the Libby Mine.
14. From on or about 1963 until on or about 1991, defendant W.R. GRACE operated a Screening Plant, a processing plant at which vermiculite concentrate was separated into different sized grades through a mechanical screening process (the "Screening Plant").
15. Prior to the mid-1970s, the Screening Plant was located at the Libby Mine.
16. After the mid-1970s, the Screening Plant was located down Rainy Creek Road from the Libby Mine, at the intersection of Highway 37 and Rainy Creek Road on the bank of the Kootenai River, about four miles from Libby, Montana.
17. Prior to the construction of the new Screening Plant at the intersection of Highway 37 and Rainy Creek Road, defendant W.R. GRACE used this property as a holding point for vermiculite concentrate trucked from the Screening Plant at the Libby Mine.

18. A facility known as the "Export Plant" was located across the railroad tracks from downtown Libby, Montana near where Highway 37 crosses the Kootenai River.
19. From on or about 1963 to at least on or about 1992, defendant W.R. GRACE trucked small amounts (relative to the volume shipped to customers from the rail loading station near the Screening Plant) of vermiculite concentrate to the Export Plant from the Screening Plant, where it was stockpiled and then placed in bags for distribution to locations in other states.
20. Defendant W.R. GRACE shipped the vermiculite concentrate (in hopper railroad cars or, in lesser amounts, in bags) to defendant W.R. GRACE owned and licensed expansion facilities and to customers throughout the United States.
21. In the operation of the Screening Plant, there were occasionally spills, processing errors, or lack of demand for certain size grades of vermiculite concentrate.
22. At various times between 1963 and 1992, defendant W.R. GRACE placed the vermiculite concentrate that had spilled, vermiculite concentrate that was affected by processing errors, or vermiculite concentrate of a grade for which there was no immediate demand in various locations on the grounds of the Screening Plant.
23. At various times between 1963 and 1990, defendant W.R. GRACE allowed employees and residents of Libby, Montana to take vermiculite concentrate for their personal use.
24. At some unknown time in the 1970s, an employee of defendant W.R. GRACE informed the Libby Public School District that vermiculite materials from the Libby Mine could be used as a surface for the Libby High School running track.

25. At some unknown time, employees of defendant W.R. GRACE transported vermiculite materials to the Libby High School and the Libby Junior High School where they were laid and served as a surface for the running tracks at both schools for approximately seven years.
26. On or about 1981, employees of defendant W.R. GRACE transported vermiculite materials to Plummer Elementary School in Libby, Montana where they were laid and served as the foundation for an outdoor ice skating rink.
27. In 1990, defendant W.R. GRACE ceased vermiculite mining at the Libby Mine. Defendant W.R. GRACE continued vermiculite processing operations at the Libby Mine and the Screening Plant until approximately 1992.
28. In the mid-1990s, defendant W.R. GRACE sold several of the properties associated with its former vermiculite operations in and near Libby, Montana.
29. On or about December 17, 1993, defendant W.R. GRACE sold the Screening Plant to Lincoln County residents Mel and Lerah Parker.
30. From approximately 1993 to on or about June, 2000, Mel and Lerah Parker used the Screening Plant for commercial operations (a commercial nursery and mushroom farm) and their personal residence.
31. From on or about 1977 to on or about 1994, the defendant W.R. GRACE leased a portion of the Export Plant to various people and entities to use for organized youth baseball games and practices.
32. From on or about 1987 to sometime before on or about May 12, 1994, defendant W.R. Grace leased a portion of the Export Plant to Jim Regh, Melvin Burnett, and others for use as their place of business.

33. In separate transactions on or about May 12, 1994 and on or about February 23, 1995, defendant W.R. GRACE transferred portions of the former Export Plant property to the City of Libby.
34. From on or about 1995 to on or about 1997, the City of Libby leased a portion of the Export Plant to various people and entities to use for organized youth baseball games and practices.
35. From on or about May 12, 1994 to on or about 2000, the City of Libby leased a portion of the Export Plant to Melvin Burnett, who used the location for a retail lumber yard and related operations.
36. On or about 1994, defendant W.R. GRACE sold to an entity known as Kootenai Development Corporation ("KDC") approximately 3,600 acres of mountainous land that comprises the Libby Mine, 1,200 acres of which had been actively mined, and an approximately 20-acre parcel now known as the "Flyway," which is located between Highway 37 and the Kootenai River, adjacent to and south of the former Screening Plant.
37. On or about November 23, 1999, Environmental Protection Agency ("EPA") representatives arrived in Libby, Montana to investigate reports of a potential hazardous waste emergency relating to asbestos contaminated vermiculite.
38. As a result of its investigation, EPA concluded that the conditions at the site presented an imminent and substantial threat to human health and the environment. The site was ultimately declared a Superfund Site pursuant to federal law. As of December 31, 2001, EPA had incurred 55,100,000.00 dollars in cleanup costs.

39. At various dates alleged in this Indictment, defendant ALAN R. STRINGER held different positions with defendant W.R. GRACE, including: from on or about September 8, 1981 to on or about 1988, he was the Libby Mine Supervisor; from on or about 1988 to on or about 1994, he was the General Manager of Operations at the Libby Mine; and from on or about 1999 to the present, he served as defendant W.R. GRACE's representative relating to EPA's Superfund Cleanup.
40. At various dates alleged in this Indictment, defendant HENRY "HARRY" A. ESCHENBACH held different positions with defendant W.R. GRACE, including: from on or about 1971 to on or about 1977, he was an Industrial Hygienist in the Industrial Chemicals Group ("ICG"); and from on or about 1977 to on or about December 31, 1996, he was the Director of Health, Safety, and Toxicology for ICG.
41. At various dates alleged in this Indictment, defendant JACK W. WOLTER held different positions with defendant W.R. GRACE, including: from on or about September 15, 1975 to on or about 1988, he was Vice-President of Mining and Engineering for the Construction Products Division ("CPD"); and from on or about 1988 to on or about 1994, he was Vice-President and General Manager of CPD.
42. At various dates alleged in this Indictment, defendant WILLIAM J. McCAIG held different positions with defendant W.R. GRACE, including: from on or about January, 1971, he was a Maintenance Engineer at the Libby Mine; from on or about 1976 to on or about 1979, he was Maintenance Superintendent at the Libby Mine; from on or about 1979 to on or about 1988, he was General Manager

of Operations at the Libby Mine; and from on or about 1988 to on or about August 31, 1995, he was Manufacturing Manager of Specialty Vermiculite of CPD Business Unit in Enoree, South Carolina.

43. At various dates alleged in this Indictment, defendant ROBERT J. BETTACCHI held different positions with defendant W.R. GRACE, including: from on or about 1979 to on or about 1986, he was General Manager of CPD; from on or about 1986 to on or about 1989, he was Vice-President of CPD; and from on or about 1989 to the present, he was President of CPD and Senior Vice-President of defendant W.R. GRACE.
44. At various dates alleged in this Indictment, defendant O. MARIO FAVORITO held different positions with defendant W.R. GRACE, including: from on or about 1970 to on or about 1993, he was corporate legal counsel for ICG; and from an unknown time but no earlier than on or about 1993 to the present, he was Assistant Secretary of defendant W.R. GRACE and Chief Group Counsel.
45. At various dates alleged in this Indictment, defendant ROBERT C. WALSH held different positions with defendant W.R. GRACE, including: from on or about 1982 to on or about 1989, he was President of CPD; from on or about 1989 to an unknown time he was Executive Vice President of Grace Specialty Chemicals Co.; and from an unknown time to on or about 1994, he was Senior Vice-President of defendant W.R. GRACE.
46. From 1976 to 1990 the Directors, Officers, and Shareholders of W.R. GRACE enjoyed at least \$140 million in after tax profits arising largely from products made with vermiculite contaminated with tremolite asbestos from the Libby Mine.

B. ASBESTOS RELATED DISEASES

47. Modern science has not established a safe level for asbestos exposure for which there is no increased risk of disease.
48. Airborne exposure to tremolite asbestos by breathing into human lungs causes scarring of the lung tissues and can cause the disease known as "asbestosis."
49. Asbestosis is a progressive disease that destroys the human lung's ability to absorb oxygen, and in severe cases, results in severe disability or death.
50. The rate of asbestosis mortality of the Libby population is 40 to 80 times higher than expected when compared to rates for Montana and the United States.
51. Airborne exposure to tremolite asbestos causes lung cancer in humans.
52. The rate of lung cancer mortality of the Libby population is approximately 30 percent higher than expected when compared to rates for Montana and the United States.
53. Airborne exposure to tremolite asbestos can cause an aggressive and fatal form of cancer in humans known as "mesothelioma." This form of cancer is extremely rare, resulting in no more than 9 cases per 1 million individuals in the United States general population, and is uniquely associated with exposure to asbestos. This form of cancer is not related to cigarette smoking.
54. Over twenty cases of mesothelioma have been identified to date among persons who lived or worked in Libby. This is a significant finding for this small population of approximately 8,000 people.
55. Airborne exposure to tremolite asbestos can cause the disease of pleural fibrosis, which is scarring of the pleural tissues surrounding the lungs. Pleural fibrosis can

result in impaired functioning of the lungs, and in more severe cases, disability and death. The development and progression of pleural fibrosis is not related to cigarette smoking.

56. Pleural fibrosis is associated with a greater risk of developing mesothelioma and lung cancer.
57. To date, approximately 1,200 residents of the Libby, Montana area have been identified as having asbestos related pleural abnormalities as a result of being exposed to tremolite asbestos produced by W.R. GRACE at the Libby Mine. Of this group, 70 percent are not former employees at the Libby Mine. Individuals have been identified with asbestos related disease whose only exposure to asbestos has been through asbestos containing vermiculite from the Libby Mine located throughout the community.
58. Asbestos related diseases have a latency period ranging from 3 to 40 years or more. That is, a person exposed to asbestos by breathing will not manifest symptoms of disease until 3 to 40 or more years after exposure.
59. Airborne exposure to tremolite asbestos can cause bloody pleural effusions. A bloody pleural effusion is a pathological collection of bloody fluid between the pleural lining and the lung. They are considered to be a possible manifestation of early stages of mesothelioma.

C. STATUTORY BACKGROUND

I. CLEAN AIR ACT

60. The Clean Air Act ("CAA"), 42 U.S.C. § 7401 *et seq.*, is the United States' comprehensive air pollution control statute. The purpose of the CAA is "to protect

and enhance the quality of the nation's air resources." 42 U.S.C. § 7401(b)(1);
see *also* 42 U.S.C. § 7470.

61. Under the CAA, any person who knowingly releases into the ambient air any hazardous air pollutant or any extremely hazardous substance, and who knows at the time that he thereby places another person in imminent danger of death or serious bodily injury is subject to criminal penalties. 42 U.S.C. § 7413(c)(5)(A).
62. Asbestos is a hazardous air pollutant. 42 U.S.C. § 7412(b)(1).
63. A "person" includes a corporation, individual and "any responsible corporate officer." 42 U.S.C. § 7602(e); 42 U.S.C. § 7413(c)(6).
64. Congress defined "serious bodily injury" as "bodily injury which involves a substantial risk of death, . . . extreme physical pain, . . . or protracted loss or impairment of the function of a bodily member, organ, or mental faculty." 42 U.S.C. § 7413(c)(5)(F).

II. TOXIC SUBSTANCES CONTROL ACT

65. The Toxic Substances Control Act, 15 U.S.C. § 2601 et. seq. ("TSCA"), regulates chemical substances and mixtures whose manufacture, processing, distribution in commerce, use, or disposal may present an unreasonable risk of injury to health or the environment.
66. Section 8(e) of TSCA, 42 U.S.C. § 2607(e) requires that any person who manufactures, processes, or distributes in commerce a chemical substance or mixture and who obtains information that reasonably supports the conclusion that such substance or mixture presents a substantial risk of injury to health or the environment shall immediately inform the Administrator of EPA of such

information, unless the person has actual knowledge that the Administrator has been adequately informed of such information.

67. At times relevant to this Indictment, EPA interpreted the requirement under TSCA 8(e) that a person "immediately inform" the Administrator to be met if the person submitted the information to EPA within 15 working days after the date the person obtained such information.

III. COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (SUPERFUND)

68. The Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9601 et seq. ("CERCLA" or "Superfund"), authorizes designated EPA personnel to conduct response actions to address releases or threatened releases of hazardous substances into the environment. 42 U.S.C. § 9604(a)(1). Asbestos is defined as a "hazardous substance" under CERCLA and EPA's implementing regulations. 42 U.S.C. § 9601(14); 40 C.F.R. 302.4.
69. Under Section 104(e)(2) of CERCLA, 42 U.S.C. § 9604(e)(2), designated EPA personnel "may require any person who has or may have information relevant to any of the following to furnish, upon reasonable notice, information and documents relating to such matter:
- (A) The identification, nature, and quantity of materials which have been or are generated, treated, stored, or disposed of at a vessel or facility or transported to a vessel or facility.
 - (B) The nature or extent of a release or threatened release of a hazardous substance or pollutant or contaminant at or from a vessel or facility.

(C) Information relating to the ability of a person to pay for or perform a cleanup.

**COUNT I
(Conspiracy)**

70. Paragraphs 1 through 69 are incorporated here as if set forth in full.
71. That beginning on or about 1976, and continuing until on or about 2002, at Libby, and other locations within and without the District of Montana, the defendants, W.R. GRACE, ALAN R. STRINGER, HENRY A. ESCHENBACH, JACK W. WOLTER, WILLIAM J. McCAIG, ROBERT J. BETTACCHI, O. MARIO FAVORITO, and ROBERT C. WALSH, and others known and unknown to the grand jury did knowingly combine, conspire and agree among themselves and others:

OBJECTS OF THE CONSPIRACY

- a. To knowingly release and cause to be released into the ambient air a hazardous air pollutant, namely asbestos, and at the time knowingly placed persons, including: families of employees of W.R. GRACE Libby vermiculite mining and processing operations; residents of Libby, Montana and surrounding communities in Lincoln County; and others in imminent danger of death or serious bodily injury in violation of 42 U.S.C. § 7413(c)(5)(A).
- b. To defraud the United States and others by impairing, impeding, and frustrating the governmental functions of the United States, including the United States Environmental Protection Agency (EPA) and the Department of Health and Human Services, specifically, the National Institute for Occupational Safety and Health ("NIOSH");

being federal agencies responsible for administering federal laws and regulations designed to protect public health and safety and the environment in violation of 18 U.S.C. § 371.

72. It was a purpose of the conspiracy to conceal and misrepresent the hazardous nature of the tremolite asbestos contaminated vermiculite, thereby enriching defendants and others.
73. It was a purpose of the conspiracy to increase profits and avoid liability by misleading the government and preventing the government from using its authorities to protect against risks to human health and the environment associated with the manufacture, processing, distribution, commerce, use, handling, disposal, and release of tremolite asbestos contaminated vermiculite.

MANNER AND MEANS OF THE CONSPIRACY

The following manner and means, among others, were used by the defendants to effectuate and perpetuate the conspiracy set forth above:

74. It was part of the conspiracy that the defendants obtained knowledge of the hazardous nature of the tremolite asbestos contaminated vermiculite through various means, including, but not limited to: scientific testing and analysis, including animal studies; epidemiological studies of employees; employee medical screening and examinations; employee medical record reviews; collection and evaluation of a deceased employee's lung tissue; review of employee death certificates; conducting employee morbidity and mortality studies; employee autopsy reviews; review of medical and scientific literature; reviewing

reports from insurance carriers; and reviewing employee worker's compensation claims.

75. It was part of the conspiracy that the defendants obtained knowledge of the propensity of tremolite asbestos contaminated vermiculite, when disturbed, to release fibers into the ambient air (also known as "friability") through various means, including, but not limited to: product testing, including attic simulation and vermiculite materials handling tests ("drop tests"); and air and bulk sampling at the Libby Mine and other defendant W.R. GRACE facilities in and around Libby, Montana, at defendant W.R. GRACE owned and licensed expansion plants, at the facilities of customers using vermiculite materials, and at the Libby High School track.
76. It was part of the conspiracy that the defendants concealed the full extent of their knowledge of the hazardous nature and friability of the tremolite asbestos contaminated vermiculite from employees of defendant W.R. GRACE Libby vermiculite mining and processing operations; families of employees of defendant W.R. GRACE Libby vermiculite mining and processing operations; industrial customers of defendant W.R. GRACE Libby vermiculite products; employees of industrial customers of defendant W.R. GRACE Libby vermiculite products; residents of Libby, Montana and surrounding communities in Lincoln County, Montana; and government authorities.
77. It was part of the conspiracy that the defendants obstructed, impeded, and frustrated the governmental authorities by withholding information regarding the hazardous nature and friability of the tremolite asbestos contaminated vermiculite

and asserting that the Libby Mine operations and Libby vermiculite posed no risk to public health and safety and the environment.

78. It was part of the conspiracy that the defendants marketed and sold tremolite asbestos contaminated vermiculite and products containing tremolite asbestos contaminated vermiculite.
79. It was part of the conspiracy that the defendants sold and leased tremolite asbestos contaminated real property and withheld information about the contamination from the purchasers of the property.
80. It was part of the conspiracy that defendants provided and distributed tremolite asbestos contaminated vermiculite material to the community, resulting in releases of asbestos into the ambient air in and around Libby, Montana and surrounding communities in Lincoln County, Montana.
81. It was part of the conspiracy that defendants caused W.R. GRACE employees and their personal effects and clothing to be contaminated with tremolite asbestos and allowed them to leave the Libby mine with these contaminated clothes, resulting in releases of tremolite asbestos into the ambient air in and around Libby, Montana and surrounding communities in Lincoln County, Montana.
82. It was part of the conspiracy that the defendants falsely described, concealed from, and failed to reveal to the government the hazardous nature and friability of the tremolite asbestos in the Libby vermiculite and the health hazards associated with exposure to tremolite asbestos.

83. It was part of the conspiracy that the defendants obstructed, impaired, impeded, and misled EPA during the course of EPA's emergency response to the asbestos contamination in and around Libby, Montana.

OVERT ACTS

In furtherance of the conspiracy and to effect its objectives, defendants, together with each other and with other persons known and unknown to the grand jury committed numerous overt acts in the District of Montana and elsewhere including, but not limited to, the following:

Eschenbach Study

84. Sometime prior to August 23, 1976 defendant ESCHENBACH gathered information regarding the lung health of defendant W.R. GRACE employees at the Libby Mine. This information was reported by an employee of defendant W.R. GRACE to defendant WOLTER in a memo dated August 23, 1976:

Statistics provided by Harry Eschenbach indicated of eighteen (18) age sixty-five (65) normal retirements, three (3) had normal chests, one (1) had no records and fourteen (14) had positive lung disease, i.e. either significant scar tissue on the lung or significant fibrosis; there have been five (5) long term disability claims, three (3) of these were employees with six (6) years of service and two (2) with between fifteen (15) and twenty-five (25) years of service. Sixty-three (63) percent of all Libby employees with over ten (10) years of service test positive.

Commission of the Fairleigh Dickinson Animal Toxicology Study (Hamster Study)

85. On or about March 15, 1976, defendants W.R. GRACE and co-conspirators contracted with Dr. William Smith of Fairleigh Dickinson University to conduct animal toxicological studies on Libby Mine tremolite asbestos and vermiculite for

70,000.00 dollars (the "Hamster Study"). The contract between defendant W.R. GRACE and Dr. Smith prohibited Dr. Smith from publishing the results of the study in scientific literature without the permission of defendant W.R. GRACE.

86. From on or about January 1977 through approximately October 1977, Dr. Smith and an employee of defendant W.R. GRACE provided regular status reports to defendants W.R. GRACE, FAVORITO, ESCHENBACH, and WOLTER on the findings of the Hamster Study showing progressive evidence of asbestos related lung disease, including a significant incidence of mesothelioma.
87. On or about May 25, 1978, Dr. Smith provided defendant W.R. GRACE a preliminary draft Final Report of the Hamster Study. The draft report concluded that 10 hamsters had died of mesothelioma, and that the findings of tumors were evidence that tremolite asbestos fibers in the sizes tested were carcinogenic (caused cancer).
88. A consultant hired by defendant W.R. GRACE revised Dr. Smith's preliminary draft Final Report including the removal of the statement that the findings of tumors in response to tremolite asbestos fibers were evidence that tremolite asbestos fibers in the sizes tested were carcinogenic (caused cancer). Defendant W.R. GRACE did not grant Dr. Smith permission to publish the results of the study in scientific literature.

The Enbionics Review

89. On or about March 29, 1977, an employee of defendant W.R. GRACE wrote a memo directing another employee of defendant W.R. GRACE to coordinate a meeting to discuss a professional epidemiological study of defendant W.R.

GRACE employees exposed to tremolite asbestos fibers. Defendants ESCHENBACH, WOLTER and FAVORITO were copied on the memo. According to the memo, two of the goals of the epidemiological study were to develop a methodology for tracking improvements in employees' health that may result from improvement in dust controls at the Libby Mine and to determine the risk of developing cancer through analysis of cause of death from selected groups of past employees.

90. On or about March 30, 1977, defendant ESCHENBACH responded to the March 29, 1977 memo regarding the proposed epidemiological study, warning that such a study would likely become public knowledge and should not be initiated unless "they [defendant W.R. GRACE] are prepared to deal with that situation."
91. On or about July 1977, defendants W.R. GRACE and ESCHENBACH hired Enbionics, a consulting firm specializing in epidemiological studies, to review employee x-rays from defendant W.R. GRACE vermiculite mines in Libby, Montana and Enoree, South Carolina.
92. On or about August 25, 1978, defendants W.R. GRACE and ESCHENBACH received Enbionics' report, which stated:

As you indicated before the project began, there is a substantial difference in the attack rates of asbestos and possible asbestos disease between the South Carolina and Montana facilities. In fact, we had only one case of clear asbestos disease in South Carolina and a few cases of possible asbestos disease. There are numerous cases of asbestos disease in Montana. The incidence of disease is independent of age, since there are a number of quite young individuals with obvious asbestos disease in Montana. Probably the difference lies in total exposure, fiber size, and mineral form.

The Libby Facility Audit Report

93. In a memo dated May 14, 1981 to defendant WOLTER, a member of defendant W.R. GRACE's Corporate Facility Audit staff confirmed that an internal audit was to be conducted of the Libby Mine operations during June 1981.
94. Defendants WOLTER and McCAIG were responsible for an overall review of the draft audit report.
95. Defendants ESCHENBACH and FAVORITO were responsible for reviewing the portion of the draft audit report relating to health effects at the Libby Mine.
96. In the Facility Audit report dated June 1981, a review of workers' x-rays was conducted. The report stated:

An analysis was run on the data to determine the impact of the wet process operation over the past five years on lung abnormalities vis-a-vis the period 1968 through 1975 with dry operations. Again the point is conceded that there are data inadequacies insofar as statistical analysis is concerned, but a trend may be perceived. Data shows an incidence of 45.1% abnormalities for five year employees during the dry mill operations (1968 through 1975) as compared to 38.4% for five year employees during the wet mill operations (1976 through 1980).

97. The report also found, based upon 1980 data, that "[e]ach additional year of tremolite exposure for an employee adds a significant 1.5 percent to the incidence of abnormal x-rays."

O.M. Scott Employees' Bloody Pleural Effusions

98. On or about November 4, 1980, defendant FAVORITO disseminated to defendant W.R. GRACE senior management, including defendant ESCHENBACH, a file produced by NIOSH. That file included information concerning "a bloody pleural effusions problem" among employees of O.M. Scott

at its Marysville, Ohio facility, where vermiculite ore from the Libby Mine was processed.

99. On or about November 12, 1980, a defendant W.R. GRACE senior manager wrote a memo to other defendant W.R. GRACE senior managers, including defendants FAVORITO and WOLTER, summarizing a meeting he had with O.M. Scott management wherein O.M. Scott expressed its intention to discontinue use of Libby ore due to the asbestos contamination.
100. On or about December 11, 1981, an employee of defendant W.R. GRACE wrote a memo to defendant W.R. GRACE senior managers, including defendants WOLTER, BETTACCHI, ESCHENBACH, and FAVORITO advising them that two employees of O.M. Scott were suing defendant W.R. GRACE alleging injury from exposure to tremolite asbestos.
101. On or about May 27, 1983, defendant WOLTER wrote a memo to defendant W.R. GRACE senior management, including defendants ESCHENBACH and WALSH, inviting them to attend a meeting with Dr. James Lockey to hear the results of Lockey's study of O.M. Scott employees. The memo referenced Dr. Lockey's articles summarizing the health effects of vermiculite exposure and the pulmonary hazards of tremolite contaminated vermiculite. The memo also referenced Dr. Lockey's "knowledge of the exposures and health knowledge of the O.M. Scott employees, twelve of which are reported to have bloody pleural effusions, alleged to be caused by tremolite exposure at the O.M. Scott plant in Marysville, Ohio."

102. On or about June 3, 1983, Dr. Lockey met with W.R. Grace senior management in Cambridge, Massachusetts and advised them of his conclusion that the bloody pleural effusion problem at O.M. Scott Company was caused by employee exposure to defendant W.R. GRACE's tremolite asbestos contaminated vermiculite concentrate from the Libby Mine.

Monson Mortality Study

103. On or about April 5, 1982, defendants W.R. GRACE and ESCHENBACH hired Richard R. Monson, M.D., of Harvard University's School of Public Health to conduct a mortality study of persons employed at the Libby Mine from 1950 to 1981. Dr. Monson collected 66 death certificates and examined the cause of death listed. Dr. Monson concluded and reported to defendants W.R. GRACE and ESCHENBACH that an excessive number of employees at the Libby Mine had died of cancer of the respiratory system including mesothelioma.
104. On or about July 28, 1982, defendant ESCHENBACH provided copies of the mortality study done by Dr. Monson on W.R. GRACE employees at the Libby Mine to defendant W.R. GRACE senior management, including defendants FAVORITO, McCAIG and WOLTER. In his memo, defendant ESCHENBACH stated, "Our major problem is death from respiratory cancer. This is no surprise."

The NIOSH Study

105. On or about November 26, 1980, an employee of defendant W.R. GRACE wrote a memo to defendant FAVORITO, copied to defendant WOLTER, describing a November 24, 1980 meeting with NIOSH representatives, which was attended by defendants ESCHENBACH and FAVORITO. The purpose of the meeting was to

discuss NIOSH's proposed epidemiological study of Libby, and the memo concluded by listing defendant W.R. GRACE's options for responding to NIOSH's proposed study. The options and recommendations were as follows:

- (a) Obstruct and block, possibly even contesting in the courts. As I understand it, we'd lose and this is not exactly the image we try to project.
- (b) Be slow, review things extensively and contribute to delay. This might not be bad policy generally and it is possible that the new Administration's policies will make NIOSH more selective in how scarce staff resources are allocated after January 20, 1981.
- (c) Publish a "preemptive epidemiological study". This could attenuate the resume-enhancement potential for NIOSH study personnel. This could also be a checkpoint for a subsequent NIOSH study when it is released.
- (d) Cooperate fully. This agency and its personnel have not always acted with high levels of professionalism on past studies. This option would save NIOSH time and effort, make their study more comprehensive and possibly rule out some inaccuracies. It would not necessarily make NIOSH's conclusions any more responsible.
- (e) Actively go upstream in NIOSH to personally repeat the same arguments, the first time immediately after receipt of protocol.
- (f) Actively seek to turn off the sources of the pressure for the study by personally repeating the same arguments. However, the sources may have supplementary reasons not fully shared with NIOSH.
- (g) Attempt to apply influence via congressmen, senators, lobbyists or others to get it turned off. However, it is not necessarily successful, can backfire, and to be effective must be developed over long periods of time due to the trust required.

There are other options as well. All should be discussed. At this time I tend to favor a phased combination of (b), (c), (e), and (f).

106. In a February 11, 1981 letter to Dr. Daniel Banks of NIOSH, defendant FAVORITO questioned the need for NIOSH's proposed study:

During our meeting on November 24th, we indicated to you that the vermiculite ore as mined at Grace's Libby, Montana mine is found along

with asbestiform tremolite contamination. Any study of vermiculite conducted in such environment can only lead to inconclusive results. This fact makes any study at Libby, Montana of questionable use, especially as it relates to NIOSH's avowed purpose of evaluating exposure to "pure vermiculite." We believe that any study at Libby will amount to nothing more than yet another verification of what is already known, viz., that excessive exposure to asbestiform material is dangerous to health. NIOSH must reconsider whether it is in anyone's best interest for it to expend scarce public funds in such redundant pursuits.

107. From on or about November 14, 1980, when NIOSH requested information regarding the Libby Mine to begin its proposed study, to at least on or about June 1981, defendant W.R. GRACE was unwilling to release the data requested.
108. On or about March 23, 1981, defendant FAVORITO informed NIOSH that defendant W.R. GRACE planned to present its position regarding the proposed NIOSH study to a higher government authority.
109. In a June 29, 1981 letter to the Acting Deputy Assistant Secretary for United States Mine Safety and Health, defendant FAVORITO questioned the utility of NIOSH's proposed study, stating that "to mount a study to assess the results of possible exposure to vermiculite appears completely unjustified given the fact that to our knowledge there is no credible evidence that adverse health effects follow from exposure to vermiculite itself," and that "utilization of Libby, Montana as a locus to study exposure to vermiculite would be a wasteful and redundant expenditure of scarce Government manpower, money and effort . . ."
110. On or about July 28, 1982, defendant ESCHENBACH provided copies of the Monson Mortality Study to defendant W.R. GRACE senior management, including defendants FAVORITO, McCAIG, and WOLTER. In his memo, defendant ESCHENBACH stated, "Our major problem is death from respiratory

cancer. This is no surprise." The memo further stated, "NIOSH would possibly not pursue the mortality portion of their study if we provided this information to them."

111. On or about March 29, 1983, defendants W.R. GRACE, WALSH, WOLTER, and ESCHENBACH began negotiations with Drs. John Corbett McDonald and Alison D. McDonald of the McGill University School of Occupational Health regarding a W.R. GRACE sponsored mortality and morbidity study of its employees at the Libby Mine. Defendant WALSH copied defendants WOLTER, ESCHENBACH and FAVORITO on the initial letter to McDonald.
112. On or about May 5, 1983, defendant ESCHENBACH disseminated to defendant W.R. GRACE senior managers, including defendants WALSH, FAVORITO and WOLTER a summary of a meeting with the Drs. McDonald regarding the proposed McGill study.
113. On or about June 15, 1983, defendants W.R. GRACE and ESCHENBACH, in response to an April 25, 1983 EPA request for additional information regarding the health effects of exposure to asbestos for all workers, informed EPA that a thorough evaluation of current employees would be part of the McGill University (McDonald, et. al.) epidemiological study.
114. On or about October 18, 1983, defendant ESCHENBACH wrote a memo to defendant WALSH, with copies to defendant W.R. GRACE senior management, including defendants McCAIG and WOLTER summarizing the study of "McNair's lung." McNair was a former employee of defendant W.R. GRACE at the Libby Mine. As related by defendant ESCHENBACH, the McGill researcher determined

that "the uncoated fiber size distribution in McNair's lung was remarkably similar to that which is found when analyzing air samples from Libby."

**Drop, Drum Transfer, Attic Simulation Tests, and
Survey of Commercial Users of Expanded Vermiculite**

115. Beginning on or about 1977, and continuing through 1982, defendant W.R. GRACE conducted "drop tests" to determine whether tremolite asbestos fibers were released to the air from various W.R. GRACE commercial and consumer products made with tremolite asbestos contaminated vermiculite from the Libby Mine.
116. These drop tests revealed to defendant W.R. GRACE that its commercial and consumer products made with vermiculite from the Libby Mine released tremolite asbestos fibers into the air.
117. On or about 1982, defendant W.R. GRACE participated in and conducted "drum transfer" tests to determine tremolite asbestos exposure levels occurring when scooping Libby vermiculite concentrate from one drum to another, and to evaluate whether mixing binders to the vermiculite concentrate would lower airborne asbestos fiber levels.
118. These drum transfer tests revealed to defendant W.R. GRACE that its vermiculite concentrate from the Libby Mine released asbestos fibers into the air when transferred from one drum to another.
119. Beginning on or about 1977, and continuing through on or about 1983, defendant W.R. GRACE conducted attic simulation tests to determine whether tremolite asbestos fibers were released to the air from ZONOLITE Attic Insulation.

120. The attic simulation tests revealed to defendant W.R. GRACE that when installed or disturbed, ZONOLITE Attic Insulation released hazardous amounts of tremolite asbestos fibers into the air.
121. From 1978 through 1979, defendant W.R. GRACE conducted a survey of its customers who used expanded vermiculite from the Libby Mine for agricultural and industrial purposes.
122. As part of this survey, defendant W.R. GRACE conducted personnel air monitoring of the employees at its customers' facilities to determine the level of airborne asbestos fiber releases generated during activities such as unloading bags of the vermiculite, emptying the vermiculite into containers, mixing the vermiculite with other materials, and bagging products made with the vermiculite.
123. Defendant W.R. GRACE also analyzed bulk samples taken from the expanded vermiculite from the Libby Mine used by its customers, as well as its customers' products made with the vermiculite.
124. As stated by CPD, the objective of this analysis was to "collect data on tremolite content on vermiculite products used by CPD customers." The purpose was to determine the "correlation between user personnel exposure to Tremolite at job site and % Tremolite in Vermiculite used and/or product produced."
125. The results of the survey revealed to defendant W.R. GRACE that the expanded vermiculite contained small amounts of tremolite asbestos, sometimes as low as 0.01% by weight.
126. The results of the survey also revealed to defendant W.R. GRACE that the expanded vermiculite released high levels of asbestos fibers from routine

occupational activities, even when the tremolite content was minimal. For example, at one fertilizer production facility, the "time weighted average" ("TWA") fiber exposure for two workers emptying bags of vermiculite was 6.83 fibers per cubic centimeter (f/cc) and 7.8 f/cc, which exceeded the regulatory limit of TWA 2.0 f/cc established by the Occupational Safety and Health Administration (OSHA) then in effect. The bulk samples from this facility showed that the tremolite asbestos content was 0.039% by weight.

127. Defendants WOLTER and ESCHENBACH received a copy of the sampling results from the survey.

Failure to Disclose Under Toxic Substances Control Act Section 8(e)

128. Defendants W.R. GRACE and ESCHENBACH failed to disclose to EPA information required by TSCA 8(e) within 15 days of receiving that information.
129. In response to EPA's request for information pursuant to TSCA 8(e), defendants W.R. GRACE and ESCHENBACH sent EPA a letter on March 24, 1983. In this notification, defendants W.R. GRACE and ESCHENBACH failed to disclose to EPA the Hamster Study, the Enbionics review, and the Monson/Harvard Mortality study, among other information required by TSCA 8(e).
130. In the March 24, 1983 TSCA submittal to EPA, defendants W.R. GRACE and ESCHENBACH falsely stated that the known information demonstrated their products as currently manufactured did not create a substantial risk and that they had "no reason to believe, there is any risk associated with the current uses of Libby vermiculite-containing products."

131. On or about March 4, 1986, defendants W.R. GRACE and ESCHENBACH submitted to EPA the documents summarizing the McGill and NIOSH studies and falsely stated that these documents contained all information requested by EPA. As in 1983, defendants W.R. GRACE and ESCHENBACH failed to disclose all information required by TSCA 8(e).
132. On or about April 1, 1992, defendants W.R. GRACE and ESCHENBACH submitted to EPA the Hamster study under a TSCA 8(e) "compliance audit program" (amnesty program). At that time, defendants W.R. GRACE and ESCHENBACH again did not submit all information they were required to submit under TSCA 8(e).

Exposure to the Libby Community

133. From on or about 1977 until on or about 1993, defendant W.R. GRACE gave away vermiculite materials contaminated with tremolite asbestos to the Libby community without disclosing the hazardous nature of the material.
134. On or about August 23, 1976, an employee of defendant W.R. GRACE wrote a memo to defendant WOLTER, that stated:

Request the ICG Safety and Health Group conduct an intensive study to determine the level of tremolite in the environment, that is at the mine or work location and in town. This study should be conducted under a variety of temperature, wind, and atmospheric conditions to determine precise levels of tremolite fibers in the air and in turn the exact magnitude of the problem. If the threshold limit values...exceed the MESA/OSHA standards in town and the surrounding area(s) and therefore pose a serious hazard to the town's population, we would then be best advised to develop a program to improve/eliminate problem areas before taking steps to discourage or forbid smoking on mine property.

135. On or about May 24, 1977, a defendant W.R. GRACE manager wrote, in an appendix to a memo copied to defendant W.R. GRACE senior management and defendant WOLTER, that the health of asbestos workers' families was adversely affected by exposure to asbestos dust carried home by workers and that the level of contamination in the home was not a low level.
136. On or about February 22, 1978, an employee of defendant W.R. GRACE wrote a memo to defendant WOLTER, copied to defendant W.R. GRACE senior management including defendant FAVORITO, with editorial changes for a pamphlet proposed to be distributed to Libby Mine employees warning of possible asbestos hazards at their workplace, including the hazard that take-home dust posed to family members. In this memo, the employee recommended that existing stocks of the pamphlet be destroyed.
137. On or about March 19, 1979, local Libby physician Richard Irons wrote a letter to defendant W.R. GRACE expressing concern about the health of Libby Mine workers and their families and the health effects of take-home dust. In the letter, Dr. Irons proposed conducting a health study. On or about April 10, 1979, defendants W.R. GRACE and ESCHENBACH wrote a memo to Libby management, copied to defendant WOLTER regarding Dr. Irons' proposed study. In the memo, defendant ESCHENBACH stated, "Irons is turning the screw. . . We either play the game his way or he is going to blow the whistle." Defendants W.R. GRACE and ESCHENBACH declined Dr. Irons' proposed study.
138. On or about July 15, 1983, defendant McCAIG wrote a memo informing defendant WOLTER that a local doctor had seen an "asbestos related pattern" in

the chest x-rays of the general Libby public and that another local doctor had observed one or two cases of asbestos related disease that the doctor "suspected might have resulted from exposure carried home by employees." Defendant McCAIG's memo summarized discussions within defendant W.R. GRACE concerning the possible institution of a mandatory uniform and shower policy to eliminate take-home dust. Defendant McCAIG concluded by saying that "a uniform and shower policy is unwarranted since adverse effects cannot be definitively proven and would only cause unwarranted fear or concern among employees and the Libby community."

139. On or about 1977, through on or about 1992, defendant W.R. GRACE failed to provide workers with adequate changing and shower facilities that would have minimized take-home dust and exposure to tremolite asbestos to the families of defendant W.R. GRACE's employees.
140. On or about March 19, 1984, defendant ESCHENBACH wrote a memo informing defendant W.R. GRACE senior management, including defendant FAVORITO, of a study published concerning dogs contracting mesothelioma from asbestos dust brought home on the clothes of asbestos workers.

Placement of Mill Tailings at Libby Schools

141. On or about 1981, defendants W.R. GRACE and McCAIG provided mill tailings to the Plummer Elementary School for use as a foundation for an outdoor ice skating rink.
142. On or about 1981, defendant W.R. GRACE employee Earl Lovick informed the Plummer Elementary School Principal that vermiculite materials should not be

used as a foundation for the ice skating rink. Lovick failed to disclose to the principal that the vermiculite materials contained tremolite asbestos.

143. From on or about 1981 and continuing through 2000, defendant W.R. GRACE failed to completely remove vermiculite materials contaminated with tremolite asbestos from the Plummer Elementary School ice skating rink.

144. From on or about 1976 through on or about 1981, defendant W.R. GRACE provided mill tailings to the Libby Public School District for use on the Junior and Senior High School running tracks.

145. On or about 1981, defendant W.R. GRACE and defendant McCAIG directed an employee of defendant W.R. GRACE to collect and analyze air samples from the Libby High School running track.

146. On or about July 8, 1981, an employee of defendant W.R. GRACE notified defendant McCAIG in writing that he had collected and analyzed personal air samples while running at the Libby High School running track, the results of which showed "surprisingly high" fiber concentrations, and stated further that "concentrations as high as 1.0 f/cc could result when the track is in a well used condition and is being used by a large number of people."

147. On or about July 27, 1981, defendant WOLTER informed his supervisor in writing of the situation involving the Libby High School running track and requested authority for the removal and replacement of the "mill coarse tailings" at an estimated cost to defendant W.R. GRACE of 18,000.00 to 20,000.00 dollars.

148. On or about July 31, 1981, defendants W.R. GRACE, WOLTER and McCAIG authorized 20,000.00 dollars to resurface the Libby Junior and Senior High

School running tracks, which according to the authorization were "surfaced with coarse tails refuse which contains high concentrations of tremolite asbestos."

149. From on or about 1981 and continuing through 2000, defendants W.R. GRACE, McCAIG, WOLTER, and STRINGER failed to completely remove vermiculite materials contaminated with tremolite asbestos from the Libby Junior and Senior High School tracks.

Negotiations and Marketing of W.R. GRACE Properties

150. On or about July 17, 1990, an employee of defendant W.R. GRACE wrote a memo to defendant BETTACCHI, copied to defendant FAVORITO, informing them that 3M Company ("3M") was interested in acquiring the Libby Mine.
151. On or about April 17, 1991, an employee of defendant W.R. GRACE wrote a memo to defendant BETTACCHI, copied to defendant FAVORITO, describing 3M's renewed interest in purchasing the Libby Mine. Defendant STRINGER provided a site tour to 3M representatives during the negotiations.
152. On or about November 11, 1991, an employee of defendant W.R. GRACE wrote a memo to defendants FAVORITO, BETTACCHI and WOLTER transmitting a letter from 3M, which stated that 3M was no longer interested in purchasing the Libby Mine based upon evidence of "potential environmental problems."
153. In a letter dated April 18, 1991 to defendant STRINGER, the Phelps Dodge Mining Company ("Phelps Dodge") advised defendant STRINGER that "the property is not of interest" to Phelps Dodge, and that "the presence of so much asbestos was the main factor for declining the property."

154. In a memo dated May 13, 1991, copied to defendants BETTACCHI, STRINGER and WOLTER, under the heading "Libby Update," an employee of defendant W.R. GRACE stated, "Libby received a letter from Phelps Dodge indicating 'no interest at this time' in pursuing any exploration of the Rainey Creek intrusive. The concern was excessive asbestos."
155. On or about July 14, 1993, defendant WOLTER wrote a memo to defendant W.R. GRACE senior management, copied to defendant BETTACCHI, describing defendant W.R. GRACE's assets in Libby. Attached to the memo was a July 6, 1993 memo to defendant WOLTER with an analysis of sales options prepared by defendant STRINGER that stated:

For the same reasons that 3M would not buy the mine, I doubt that any other large corporation will come forward with an offer to buy the entire property. If Grace is going to be able to transfer all of the future responsibilities and liabilities to someone else, they are going to have to be willing to sell to some small organization.

Export Plant Property (Baseball Fields)

156. From on or about 1977 and continuing until on or about 1994, knowing the Export Plant property was contaminated with tremolite asbestos, defendant W.R. GRACE leased said property to various people and entities to use for organized youth baseball games and practices.
157. On or about March 9, 1993, defendants W.R. GRACE and STRINGER, knowing the Export Plant property was contaminated with tremolite asbestos, stated in a letter to the Mayor of Libby that it was "W.R. GRACE and Co's intent to donate to the city of Libby" the Export Plant property.

158. On or about February 23, 1995, defendants W.R. GRACE, BETTACCHI and FAVORITO, knowing the Export Plant property was contaminated with tremolite asbestos, signed a deed transferring title of the Export Plant property to the City of Libby without disclosing to the city the health hazard associated with said property.

Export Plant Property (Commercial Buildings)

159. On or about 1987, defendants W.R. GRACE and McCAIG, knowing the Export Plant property was contaminated with tremolite asbestos, leased a portion of said property to Mon-Ida, a business owned by James Regh, and failed to disclose the health hazard associated with said property.

160. On or about October 1, 1989, and continuing until approximately 1994, defendants W.R. GRACE and STRINGER knowing the Export Plant property was contaminated with tremolite asbestos, leased a portion of said property to Millwork West, a business owned by Melvin Burnett, and failed to disclose the health hazard associated with said property.

161. On or about May 12, 1994, defendants W.R. GRACE, BETTACCHI and FAVORITO, knowing the Export Plant property was contaminated with tremolite asbestos, signed a deed transferring title of the Export Plant property to the City of Libby without disclosing to the city the health hazard associated with said property.

162. From on or about May 12, 1994, defendants W.R. GRACE, STRINGER, BETTACCHI, and FAVORITO failed to disclose the health hazard associated with

the tremolite asbestos contamination of the property to the City of Libby and the occupants of said property.

Sale of the Screening Plant Property to Parkers

163. On or about October 1992, defendants W.R. GRACE and STRINGER approached the Parkers and offered the Screening Plant property for sale.
164. On or about December 9, 1992, defendants W.R. GRACE and STRINGER signed an Agreement to Sell and Purchase, effecting the sale of the Screening Plant property to the Parkers.
165. On or about December 17, 1993, defendants W.R. GRACE and BETTACCHI knowing the Screening Plant property was contaminated with tremolite asbestos, signed a deed transferring title of the Screening Plant property to the Parkers and failed to disclose the health hazard associated with said property.
166. Beginning on or about December 17, 1993, defendants W.R. GRACE, BETTACCHI and STRINGER, knowing the Screening Plant property was contaminated with tremolite asbestos and knowing that the Parkers resided on and established a commercial nursery on said property, failed to disclose the health hazard associated with said property.
167. On or about April 19, 2000, subsequent to EPA notifying the Parkers of the potential contamination of their property, defendants W.R. GRACE and STRINGER delivered a check for 40,000.00 dollars to the Parkers.

Property Transactions with KDC

168. On or about October 17, 1994, defendants W.R. GRACE and BETTACCHI executed a Purchase and Sales Contract with Kootenai Development Company

("KDC") wherein defendant W.R. GRACE sold the properties known as the "Mine Site" and the "Flyway."

169. Sometime after October 17, 1994 but before July 14, 2000, defendant WOLTER became a shareholder in KDC by investing approximately 600.00 dollars.
170. On or about July 14, 2000, defendant W.R. GRACE, knowing that EPA was negotiating with KDC to use the mine site to return the contaminated materials removed from the community, signed a Stock Purchase Agreement wherein defendant W.R. GRACE agreed to purchase all the stock shares of KDC, thereby obtaining control over the property known as the "Mine Site," the "Flyway" and the "Bluffs."
171. On or about July 14, 2000, defendant W.R. GRACE paid approximately 2,323,685.62 dollars to the principals of KDC pursuant to the Stock Purchase Agreement referred to in ¶ 170. As payment for his shares in KDC, defendant WOLTER received approximately 1.3 million dollars from defendant W.R. GRACE.
172. On or about July 18, 2000, defendant W.R. GRACE denied the EPA Superfund Emergency Response Team access to the property known as the "Mine Site," the "Flyway" and the "Bluffs."

Obstruction of EPA's Superfund Clean-Up

173. On or about November 23, 1999, defendants W.R. GRACE and STRINGER told the EPA On-Scene Coordinator that Libby Mine vermiculite concentrate at the Export Plant and at the Screening Plant contained less than one percent tremolite asbestos.

174. On or about November 23, 1999, defendants W.R. GRACE and STRINGER told the EPA On-Scene Coordinator that historical asbestos contamination problems at the Libby Mine had been resolved and provided one page of air monitoring data gathered during closure of the mine site to demonstrate that current conditions were safe.
175. From on or about November 23, 1999 through approximately spring of 2000, defendants W.R. GRACE and STRINGER led EPA employees and contractors associated with EPA's Superfund cleanup, to various locations that were contaminated with tremolite asbestos, including: the "Mine Site," "Rainy Creek Road," the "Screening Plant," the "Flyway" and the "Export Plant," without disclosing the extent and nature of the contamination at these locations.
176. On or about February 22, 2000, defendants W.R. GRACE and STRINGER responded to an EPA CERCLA104(e) Request For Information regarding the "Libby Asbestos Site" and provided the following false and misleading information: that defendant W.R. GRACE did not provide vermiculite contaminated with tremolite asbestos to the general public in Libby.
177. On or about February 22, 2000, defendants W.R. GRACE and STRINGER responded to an EPA CERCLA 104(e) Request For Information regarding the "Libby Asbestos Site" and failed to inform EPA that defendant W.R. GRACE had donated vermiculite mill coarse tailings contaminated with tremolite asbestos to Libby public schools for surfacing the Junior High School running track.
178. On or about February 22, 2000, defendants W.R. GRACE and STRINGER responded to an EPA CERCLA 104(e) Request For Information regarding the

"Libby Asbestos Site" and failed to inform EPA that defendant W.R. GRACE had donated vermiculite mill coarse tailings contaminated with tremolite asbestos to the Libby Public School District for the foundation of the Plummer Elementary School outdoor ice skating rink.

179. On or about February 22, 2000, defendants W.R. GRACE and STRINGER responded to an EPA CERCLA 104(e) Request For Information regarding the "Libby Asbestos Site" and failed to disclose that defendant W.R. GRACE used waste materials contaminated with tremolite asbestos to "sand" Rainy Creek Road.
180. On or about February 22, 2000, defendants W.R. GRACE and STRINGER responded to an EPA CERCLA 104(e) Request For Information regarding the "Libby Asbestos Site" and failed to disclose all locations where asbestos contaminated vermiculite materials were located, including: the "Flyway" and the "Bluffs."
181. On or about February 22, 2000, defendants W.R. GRACE and STRINGER responded to an EPA CERCLA 104(e) Request For Information regarding the "Libby Asbestos Site" and provided the following false and misleading information: that defendant W.R. GRACE employees did not regularly leave the facility with dust contaminated with tremolite asbestos on their clothing.
182. On or about February 22, 2000, defendants W.R. GRACE and STRINGER responded to an EPA CERCLA 104(e) Request For Information regarding the "Libby Asbestos Site" and failed to disclose all air and environmental media sampling information.

183. On or about February 22, 2000, defendants W.R. GRACE and STRINGER responded to an EPA CERCLA 104(e) Request For Information regarding the "Libby Asbestos Site" and failed to disclose the existence and dispositions of the following waste streams, among others: "Stoner Rock" and waste vermiculite concentrate.

W.R. Grace Letter to EPA Administrator

184. On or about April 10, 2002, in response to a proposal by EPA to declare a "public health emergency" for the City of Libby that would allow EPA to remove asbestos containing attic insulation from homes in Libby, defendant W.R. GRACE, in a letter to the Administrator of EPA, stated the following:

- (i) "Grace's expanded vermiculite, which was used in ZAI, poses no risk to human health or the environment;"
- (ii) ". . . [ZAI] contains biologically insignificant amounts of respirable asbestos fibers;"
- (iii) ". . . it is reasonable to expect that disturbance of [ZAI] will not result in hazardous levels of airborne asbestos fibers;" and
- (iv) ". . . there is no credible reason to believe that ZAI has ever caused an asbestos-related disease in anyone who has used in his/her home."

In violation of 18 U.S.C. § 371.

COUNT II
(Clean Air Act - Knowing Endangerment)

185. Paragraphs 1 through 69 and 84 through 184 are incorporated by reference as if realleged in full.
186. That beginning on or about November 15, 1990, and continuing until the present, at Libby, within the State and District of Montana, defendant W.R. GRACE did knowingly release and caused to be released into the ambient air a hazardous air pollutant, namely, asbestos, and at the time, knowingly placed another person, namely the residents of the town of Libby and Lincoln County in imminent danger of death or serious bodily injury by providing and distributing asbestos contaminated vermiculite material to the community; and by causing defendant W.R. GRACE employees and their personal effects to be contaminated with asbestos, in violation of 42 U.S.C. § 7413(c)(5)(A), 18 U.S.C. § 2.

COUNT III
(Clean Air Act - Knowing Endangerment)

187. Paragraphs 1 through 69 and 84 through 184 are incorporated by reference as if realleged in full.
188. That beginning on or about December, 1993, and continuing until on or about June 15, 2000, at Libby within the State and District of Montana, the defendants, W.R. GRACE, ALAN R. STRINGER, JACK W. WOLTER, and ROBERT J. BETTACCHI did knowingly release and caused to be released into the ambient air a hazardous air pollutant, namely, asbestos, and at the time knowingly placed another person in imminent danger of death or serious bodily injury by selling real

property known as the "Screening Plant" to the Parker family, in violation of 42 U.S.C. § 7413(c)(5)(A), 18 U.S.C. § 2.

COUNT IV
(Clean Air Act - Knowing Endangerment)

189. Paragraphs 1 through 69 and 84 through 184 are incorporated by reference as if realleged in full.
190. That beginning on or about November 15, 1990, and continuing until on or about the summer of 2000, at Libby within the State and District of Montana, the defendants, W.R. GRACE, ALAN R. STRINGER, JACK W. WOLTER, and ROBERT J. BETTACCHI did knowingly release and caused to be released into the ambient air a hazardous air pollutant, namely, asbestos, and at the time knowingly placed another person in imminent danger of death or serious bodily injury by leasing a property known as the "Export Plant" to the Burnetts and selling the property known as the "Export Plant" to the City of Libby, in violation of 42 U.S.C. § 7413(c)(5)(A), 18 U.S.C. § 2.

COUNT V
(Wire Fraud)

191. Paragraphs 1 through 69 and 84 through 184 are incorporated by reference as if realleged in full.
192. That from on or about November, 1992 and continuing until late April, 2000, at Libby, within the State and District of Montana, the defendants W.R. GRACE, ALAN R. STRINGER, JACK W. WOLTER, and ROBERT J. BETTACCHI, having devised or intending to devise a scheme or artifice to defraud that is to obtain money from the Parkers and to avoid liability by selling property known as the

"Screening Plant" to the Parkers without disclosing the health hazard associated with tremolite asbestos contamination on the property, did for the purpose of executing said scheme, on April 12, 2000 transmit or cause to be transmitted by means of wire, communications in interstate or foreign commerce, namely, a Letter of Intent, describing defendant W.R. GRACE's plan for cleaning the "Screening Plant" and the compensation the Parker's would receive, in violation of 18 U.S.C. § 1343 and 18 U.S.C. § 2.

**COUNT VI
(Wire Fraud)**

193. Paragraphs 1 through 69 and 84 through 184 are incorporated by reference as if realleged in full.
194. That from on or about 1994 and continuing until late July, 2000, at Libby, within the State and District of Montana, defendants W.R. GRACE, JACK W. WOLTER and ALAN R. STRINGER having devised or intending to devise a scheme or artifice to defraud, that is to avoid liability by selling and subsequently purchasing properties known as the "Mine site" and "Flyway" from KDC, Inc., did for the purpose of executing said scheme, on July 12, 2000, transmit or cause to be transmitted by means of wire, communications in interstate or foreign commerce, wiring instructions directing the transmission of payment for the purchase of KDC, Inc. stock, in violation of 18 U.S.C. § 1343 and 18 U.S.C. § 2.

COUNT VII
(Obstruction of Justice)

195. Paragraphs 1 through 69 and 84 through 184 are incorporated by reference as if realleged in full.
196. On or about November 23, 1999, in the District of Montana, defendants W.R. GRACE and ALAN R. STRINGER, did corruptly obstruct, impede, and endeavor to influence, obstruct, and impede the due and proper administration of the law under which a pending proceeding was being had before the United States Environmental Protection Agency, an agency of the United States, by providing the following false and misleading information to the United States Environmental Protection Agency, to wit: that W.R. GRACE's vermiculite concentrate contained less than one percent tremolite asbestos and that historical asbestos contamination problems at the Libby mine had been resolved in violation of 18 U.S.C. §§ 1505 and 1515(b), and 18 U.S.C. § 2.

COUNT VIII
(Obstruction of Justice)

197. Paragraphs 1 through 69 and 84 through 184 are incorporated by reference as if realleged in full.
198. On or about February 22, 2000, in the District of Montana, defendants W.R. GRACE and ALAN R. STRINGER, did corruptly obstruct, impede, and endeavor to influence, obstruct, and impede the due and proper administration of the law under which a pending proceeding was being had before the United States Environmental Protection Agency, an agency of the United States, by providing to the United States Environmental Protection Agency false and misleading

information in defendant W.R. GRACE's response to an EPA CERCLA 104(e) Request for Information, to wit:

1. that W.R. GRACE did not provide vermiculite to the general public;
2. that W.R. GRACE employees did not regularly leave the mine with tremolite dust on their clothing;
3. that W.R. GRACE only informed EPA that it had provided vermiculite mill coarse tailings for use on the Libby High School running track, when in truth and in fact, W.R. GRACE had placed vermiculite mill coarse tailings at the Libby Junior High School running track and at the Plummer Elementary School ice skating rink;
4. that W.R. GRACE took actions to treat the roadway to the mine to minimize dust created by vehicular traffic, when in truth and in fact, W.R. GRACE used vermiculite mill tailings, to construct, surface and sand the roadway; and
5. that W.R. GRACE failed to inform EPA of air and environmental media sampling studies and results.

In violation of 18 U.S.C. §§ 1505 and 1515(b), and 18 U.S.C. § 2.

COUNT IX
(Obstruction of Justice)

199. Paragraphs 1 through 69 and 84 through 184 are incorporated by reference as if realleged in full.
200. On or about July 18, 2000, in the District of Montana, defendants W.R. GRACE and ALAN R. STRINGER, did corruptly obstruct, impede, and endeavor to influence, obstruct, and impede the due and proper administration of the law under which a pending proceeding was being had before the United States Environmental Protection Agency, an agency of the United States, by denying the EPA Superfund Emergency Response Team access to the property known as the "Mine Site," the "Flyway" and the "Bluffs." In violation of 18 U.S.C. §§ 1505 and 1515(b), and 18 U.S.C. § 2.

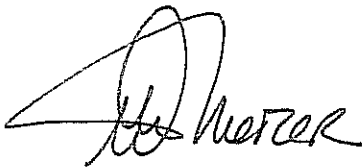
COUNT X
(Obstruction of Justice)

201. Paragraphs 1 through 69 and 84 through 184 are incorporated by reference as if realleged in full.
202. On or about April 10, 2002, in the District of Montana, defendant W.R. GRACE did corruptly obstruct, impede, and endeavor to influence, obstruct, and impede the due and proper administration of the law under which a pending proceeding was being had before the United States Environmental Protection Agency, an agency of the United States, by providing the following false and misleading information to the United States Environmental Protection Agency, to wit: in a letter to the Administrator of the EPA, stated the following: "Grace's expanded vermiculite, which was used in ZAI, poses no risk to human health or the

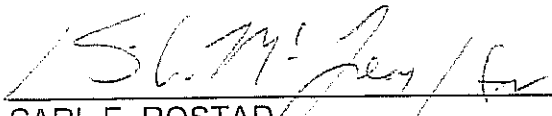
environment;" ". . . [ZAI] contains biologically insignificant amounts of respirable asbestos fibers;" ". . . it is reasonable to expect that disturbance of [ZAI] will not result in hazardous levels of airborne asbestos fibers;" and ". . . there is no credible reason to believe that ZAI has ever caused an asbestos-related disease in anyone who has used in his/her home." In violation of 18 U.S.C. §§ 1505 and 1515(b), and 18 U.S.C. § 2.

A TRUE BILL.


FOREPERSON



WILLIAM W. MERCER
United States Attorney



CARL E. ROSTAD
Criminal Chief Assistant U.S. Attorney

DEFENDANT _____

BAIL _____

CRIMISUM

Returnable 2/22/05
@ 1:30 p.m. in M.O.A., before
L.B.E. All Dft's

Invoice Date, Plant Number, Shipped To, Quantity, & Description

Invoice dates of 12/31/2005=unknown or illegible

Invoice		Ship To Company /		Shipped To Location City & State		Notes (as written on Invoice)	
Date	Plant #	Division Name					
> 11/16/1988	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons	Pounds						
32.50	65,000.00	No. 2 Crude Vermiculite					
> 6/26/2000	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons	Pounds						
95.00	190,000.00	No. 2 Crude Vermiculite, No. 3 Crude Vermiculite					
> 6/13/1985	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons	Pounds						
32.50	65,000.00	No. 2 Crude Vermiculite					
> 6/13/1985	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons	Pounds						
64.10	128,200.00	No. 3 Crude Vermiculite					
> 4/2/1985	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons	Pounds						
32.50	65,000.00	No. 2 Crude Vermiculite					
> 4/2/1985	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons	Pounds						
64.00	128,000.00	No. 3 Crude Vermiculite					
> 5/13/1986	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons	Pounds						
96.80	193,600.00	No. 2 Crude Vermiculite, No. 3 Crude Vermiculite					
> 1/14/1986	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons	Pounds						
96.60	193,200.00	No. 2 Crude Vermiculite, No. 3 Crude Vermiculite					
> 10/24/1986	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons	Pounds						
96.40	192,800.00	No. 2 Crude Vermiculite, No. 3 Crude Vermiculite					

Monday, November 27, 2017

Enforcement Confidential

Page 1 of 3

<i>Invoice</i>		<i>Ship To Company /</i>		<i>Shipped To Location City & State</i>		<i>Notes (as written on Invoice)</i>	
<i>Date</i>	<i>Plant #</i>	<i>Division Name</i>					
> 10/30/1985	711	Robinson Insulation Company	1226 River Drive	Great Falls, MT			
Tons	Pounds						
96.40	192,800.00	No. 3 Crude Vermiculite, Oil Treated					
> 8/20/1985	711	Robinson Insulation Company	1226 River Drive	Great Falls, MT			
Tons	Pounds						
96.10	192,200.00	No. 2 Crude Vermiculite, Oil Treated, No. 3 Crude Vermiculite, Oil Treated					
> 2/21/1985	711	Robinson Insulation Company	1226 River Drive	Great Falls, MT			
Tons	Pounds						
96.60	193,200.00	No. 3 Crude Vermiculite No. 2 Crude Vermiculite					
> 12/31/2005	711	Robinson Insulation Company	1226 River Drive	Great Falls, MT			
Tons	Pounds						
61.70	123,400.00	Hopper (2) No. 2 Crude Vermiculite					
32.00	64,000.00	Hopper (3) No. 3 Crude Vermiculite					
> 10/1/1985	711	Robinson Insulation Company	1226 River Drive	Great Falls, MT			
Tons	Pounds						
97.20	194,400.00	No. 3 Crude Vermiculite, Oil Treated, No. 4 Crude Vermiculite, Oil Treated					
> 8/20/1985	711	Robinson Insulation Company	1226 River Drive	Great Falls, MT			
Tons	Pounds						
96.10	192,200.00	No. 2 Crude Vermiculite, No. 3 Crude Vermiculite, Oil Treated					
> 11/16/1988	711	Robinson Insulation Company	1226 River Drive	Great Falls, MT			
Tons	Pounds						
64.20	128,400.00	No. 3 Crude Vermiculite					
> 9/1/1988	711	Robinson Insulation Company	1226 River Drive	Great Falls, MT			
		Construction Products Division					
Tons	Pounds						
32.50	65,000.00	No. 2 Crude Vermiculite					
> 2/21/1985	711	Robinson Insulation Company	1226 River Drive	Great Falls, MT			
Tons	Pounds						
96.60	193,200.00	No. 2 Crude Vermiculite, No. 3 Crude Vermiculite, Oil Treated					

Monday, November 27, 2017

Enforcement Confidential

Invoice *Ship To Company /* *Shipped To Location City & State* *Notes (as written on Invoice)*

> 4/2/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

96.50 193,000.00 No. 2 Crude Vermiculite, No. 3 Crude Vermiculite

> 6/13/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

96.60 193,200.00 No. 2 Crude Vermiculite, No. 3 Crude Vermiculite

> 5/4/1988 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

94.60 189,200.00 No. 2 Crude Vermiculite, No. 3 Crude Vermiculite

> 3/28/1988 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

96.60 193,200.00 No. 2 Crude Vermiculite, No. 3 Crude Vermiculite

> 1/7/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

96.70 193,400.00 No. 2 Crude Vermiculite, No. 3 Crude Vermiculite

> 1/14/1986 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

96.60 193,200.00 No. 2 Crude Vermiculite, No. 3 Crude Vermiculite

> 10/1/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

97.20 194,400.00 No. 3 Crude Vermiculite, No. 4 Crude Vermiculite

> 10/30/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

96.40 192,800.00 No. 3 Crude Vermiculite

> 1/7/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

96.70 193,400.00 No. 2 Crude Vermiculite No. 3 Crude Vermiculite

State Subtotals

State MT

Invoices: 27

Invoices: 27

Monday, November 27, 2017

Enforcement Confidential



O M Scott & Sons
Marysville, Ohio 43040
(513) 644-0011

June 27, 1978

03663286

Mr. William Hanlon
W. R. Grace & Company
Construction Products Division
62 Whittemore Avenue
Cambridge, Massachusetts 02140

Dear Bill:

As we discussed, Scott in their plant environment, do meet all requirements in safe handling of vermiculite. Therefore, you may remove the placards on cars shipped from Libby to Marysville.

You also indicated we should see improvements on air sampling when using Libby ore, due to process improvements you have made at the mine since the first of year. Frankly, we have not experienced improvements on air sampling due to your process improvements. This is an ongoing program, so we can keep you advised of our experience. I would be interested in knowing what percent reduction you experienced at other locations.

Bill, I trust you graduated cum laude. Look forward to your call upon return from school.

Sincerely yours,

S. V. Chamberlain
Director of Purchasing

by

RECEIVED

JUN 30 1978

CONST. PROD. DIV.
AG/HORT. DEPT.

15076118

11-4

RECORD OF ALL ENGINEERING FIBER SAMPLES (TWA)
FOR THE LIBBY OPERATIONS

1984 - 1985 - 1986 - 1987 - 1988 - 1989 - 1990

LOCATION OF SAMPLE	FIBERS/CC						PAGE: 1
	1984	1985	1986	1987	1988	1989	
1000 TON BIN	0	0	0	0.044672	0	0	
	0	0	0	0.052374	0	0	
	0	0	0	0.057624	0	0	
AVERAGE	0	0	0	0.052223	0	0	
10TH FLOOR MILL	0.097420	0	0	0	0	0	
	0.000000	0	0	0	0	0	
	0.155380	0	0	0	0	0	
	0.162670	0	0	0	0	0	
	0.161350	0	0	0	0	0	
	0.125720	0	0	0	0	0	
	0.225280	0	0	0	0	0	
	0.020340	0	0	0	0	0	
	0.105870	0	0	0	0	0	
	0.093940	0	0	0	0	0	
	0.075090	0	0	0	0	0	
	0.078800	0	0	0	0	0	
	0.370370	0	0	0	0	0	
	0.204804	0	0	0	0	0	
	0.179791	0	0	0	0	0	
	0.163063	0	0	0	0	0	
	0.107298	0	0	0	0	0	
	0.094273	0	0	0	0	0	
	0.086384	0	0	0	0	0	
	0.236043	0	0	0	0	0	
	0	0.276070	0	0	0	0	
	0	0.309940	0	0	0	0	
	0	0	0.012403	0	0	0	
	0	0	0.010000	0	0	0	
	0	0	0.140000	0	0	0	
AVERAGE	0.128635	0.153097	0.293005	0.054134	0	0	
1ST FLOOR BATHHOUSE	1.618210	0	0	0	0	0	
	0.137540	0	0	0	0	0	
	0.023260	0	0	0	0	0	
	0.052290	0	0	0	0	0	
	0.040840	0	0	0	0	0	
	0.494850	0	0	0	0	0	
	1.197829	0	0	0	0	0	
	0.234513	0	0	0	0	0	
	0.029969	0	0	0	0	0	
	0.026183	0	0	0	0	0	

		FIBERS/CC						PAGE: 18
LOCATION OF SAMPLE	1984	1985	1986	1987	1988	1989	1990	
	0	0.052948	0	0	0	0	0	
AVERAGE	0.103647	0.042146	0	0	0	0	0	
OS&B STACKER SIDE								
	0.094440	0	0	0	0	0	0	
	0.061940	0	0	0	0	0	0	
	0.130730	0	0	0	0	0	0	
	0.030640	0	0	0	0	0	0	
	0	0.029531	0	0	0	0	0	
	0	0.082953	0	0	0	0	0	
	0	0	0.033640	0	0	0	0	
AVERAGE	0.079438	0.046242	0.033640	0	0	0	0	
OS&B UNDER								
	0	0	0	0.450653	0	0	0	
AVERAGE	0	0	0	0.450653	0	0	0	
OUTSIDE ELEG SHOP								
	0	0	0	0.009742	0	0	0	
AVERAGE	0	0	0	0.009742	0	0	0	
RAYETTA MORRISON'S OFFICE								
	0	0	0	0	0.013228	0	0	
AVERAGE	0	0	0	0	0.013228	0	0	
RESEARCH ASSAY AREA								
	0.009310	0	0	0	0	0	0	
	0.009310	0	0	0	0	0	0	
	0	0	0.017540	0	0	0	0	
AVERAGE	0.009310	0	0.017540	0	0	0	0	
RIVER LOADING DOCK								
	0.031620	0	0	0	0	0	0	
AVERAGE	0.031620	0	0	0	0	0	0	
RIVER LOADING RAILCARS								
	0	0.924869	0	0	0	0	0	
	0	2.507515	0	0	0	0	0	
	0	0.971662	0	0	0	0	0	

LOCATION OF SAMPLE	FIBERS/CC						PAGE: 19
	1984	1985	1986	1987	1988	1989	
AVERAGE	0	1.468679 0	0	0	0	0	
RIVER LOADING TUNNELS							
0	0	0.010900 0	0	0	0	0	
0	0	5.420320 0	0	0	0	0	
0	0	1.601990 0	0	0	0	0	
0	0	4.449970 0	0	0	0	0	
0	0	3.337520 0	0	0	0	0	
0	0	2.321720 0	0	0	0	0	
0	0	1.399100 0	0	0	0	0	
0	0	3.651990 0	0	0	0	0	
0	0	0.007790 0	0	0	0	0	
0	0	3.390280 0	0	0	0	0	
AVERAGE	0	0	2.586958 0	0	0	0	
SBO ROOM INCOMING BELT	0	0	0	0	0.274964 0	0	
AVERAGE	0	0	0	0	0.274964 0	0	
SBO TREATMENT ROOM							
0	1.739500 0	0	0	0	0	0	
0	3.957940 0	0	0	0	0	0	
0	2.073210 0	0	0	0	0	0	
0	2.096879 0	0	0	0	0	0	
0	1.897123 0	0	0	0	0	0	
0	1.026739 0	0	0	0	0	0	
0	1.237084 0	0	0	0	0	0	
0	0.451272 0	0	0	0	0	0	
0	0.530344 0	0	0	0	0	0	
0	0.809165 0	0	0	0	0	0	
0	0.532543 0	0	0	0	0	0	
0	0.502789 0	0	0	0	0	0	
0	0.598558 0	0	0	0	0	0	
0	0.037020 0	0	0	0	0	0	
0	0.076194 0	0	0	0	0	0	
0	0.239383 0	0	0	0	0	0	
0	0.389128 0	0	0	0	0	0	
0	0.132167 0	0	0	0	0	0	
0	0.036206 0	0	0	0	0	0	
0	0.016020 0	0	0	0	0	0	
0	0.004266 0	0	0	0	0	0	
0	0.000000 0	0	0	0	0	0	
0	0.304258 0	0	0	0	0	0	
0	0.201715 0	0	0	0	0	0	
0	0.201855 0	0	0	0	0	0	
0	0.169414 0	0	0	0	0	0	
0	0.542457 0	0	0	0	0	0	

1 Q. Good morning, Mr. McCaig -- or Mr. Geiger. Sorry about
2 that. You discussed many of the monthly reports that you put
3 together as the industrial hygienists at the Libby mine and you
4 went through many of the steps and procedures that you put in
5 place to protect the workers from exposure to asbestos, right?

6 A. Correct.

7 Q. And I just wanted to go back through some of those with
8 you and ask you some specific questions about them. So first
9 we'll turn to Defendants' 5072.

10 THE COURT: Do you have those on your machine or do
11 you want to have the defense bring them up?

12 MR. McLEAN: We do not have them, just got them this
13 morning.

14 THE COURT: All right. There you go.

15 MR. McLEAN: Thank you, sir.

16 Q. (By Mr. McLean) And this was a document that you put
17 together back in 1978, as I understand it, to describe the
18 pollution control efforts for August '78, right?

19 A. Yes.

20 Q. If we go down to the last page, I want to ask you about
21 your statement here.

22 *Several samples were collected in the Libby area to*
23 *gather data to assess possible significant fiber levels some*
24 *distance from our property. All samples showed very low levels*
25 *averaging less than .01 fiber per CC. The fiber counted were*

1 *also of questionable origin?*

2 And now I don't think you could tell us exactly
3 where these samples were taken, right?

4 A. Not without -- not without the data sheets that back
5 them up. Oh, and there were areas in Libby that I didn't
6 recall exactly where they were at. I didn't do the sampling.

7 Q. Right. But these samples that you're referencing here,
8 these were not personal samples?

9 A. No, these were engineering or outside air samples.

10 Q. I'm picturing some sort of device on a stick or
11 something stationary, right?

12 A. Somewhere that you could attach them to, drawing,
13 getting air, yes.

14 Q. So it wasn't on a person, drawing particular materials?

15 A. Yes.

16 Q. Much like you were when you ran around the track, doing
17 the sampling?

18 MR. COATES: Objection Your Honor, beyond the scope.

19 THE COURT: Overruled, he's not talking about the
20 track, he's just asking about the device.

21 THE WITNESS: Could you repeat that please?

22 Q. (By Mr. McLean) These devices that you're talking about
23 being stationary, that you reference here in D 5072 --

24 A. Yeah.

25 Q. -- they weren't personal air monitoring samples, like

1 you wear -- like workers wear to take those type of samples?

2 A. It was the same equipment. One could have been attached
3 to a permanent structure, the other one would have been
4 attached to a person.

5 Q. All right. But the type of equipment that I'm talking
6 about, the personal air monitors, that's the type that you
7 would use when you did your sampling, running around the high
8 school track.

9 A. Yeah, it's the same exact equipment we used to collect
10 the engineering samples.

11 Q. All right. I want to go to page eight of this document
12 and just direct your attention to C-70, which is headed,
13 *Export*. Is that the export plant facility?

14 A. Yes.

15 Q. And I just wanted to ask you for your impression of
16 those numbers there, 1.8 and 1.4. Those were relatively high,
17 weren't they?

18 A. Yes, they were some of the higher ones in the operation.

19 Q. And can you tell us what sort of activities generate
20 those numbers?

21 A. We talked about earlier the bagging and handling of the
22 bags, at that facility.

23 Q. And you took some steps, as I understand your testimony,
24 to solve the dust problem at the export plant, solve the
25 release of asbestos problem there.

1 A. Yes.

2 Q. And what were the steps that you took again?

3 A. Basically to provide filtered air to the -- well, there
4 was a number of things we did beyond this, what we talked
5 about, but the biggest project we did was to put a flexible
6 duct, if you will, with filtered air to supply fresh air to --
7 in a movable duct for the folks that were filling bins or
8 filling railcars.

9 Q. And so I'm just trying to picture this tube of air
10 coming down to some area where there's workers.

11 A. A worker, yeah.

12 Q. A worker. And it's blowing air into that area?

13 A. Yes.

14 Q. And where did that air go?

15 A. Outside.

16 Q. Outside the building?

17 A. Outside the boxcar.

18 Q. So you just blew air into the boxcar?

19 A. Yes.

20 Q. And then it blew out the other side?

21 A. Ah, would have been -- only one side open on the boxcar,
22 yes.

23 Q. So it went from inside the boxcar to the outside air?

24 A. Yes.

25 Q. And I think you maybe mentioned today that this concept

1 of the solution to pollution is dilution. You're familiar with
2 that, right?

3 A. Yes, I am.

4 Q. And that's the concept that you're talking about. When
5 you blow air into the boxcar, you're trying to dilute the
6 asbestos fibers in the boxcar.

7 A. Trying to protect the worker in the boxcar, right.

8 Q. Right, by diluting the fibers.

9 A. We actually filtered the air before we put it in, too,
10 right, so ...

11 Q. Right, so when it went in there, the idea was to dilute
12 the fibers in the boxcar and --

13 A. Yes, but primarily by supplying him with a whole new
14 source of air to breathe, filtered air.

15 Q. And really, all I'm asking about, where those fibers
16 went, and it sounds like they blew it into the outside air.

17 A. Yes.

18 Q. Would that be correct?

19 A. That would be correct.

20 Q. And wasn't the export plant -- this was the facility
21 that was by the baseball fields, right?

22 A. I don't recall exactly where the baseball field was, but
23 they were relatively close.

24 Q. And there was a railroad track that ran by that
25 facility, right?

1 A. Yes.

2 Q. And so for how long was this process in place where you
3 were blowing asbestos fibers out of the boxcar into the air?

4 MR. LANCASTER: Objection, beyond the scope,
5 relevance as to time.

6 THE COURT: Overruled.

7 THE WITNESS: Would you repeat that please?

8 Q. (By Mr. McLean) For what time period was this process
9 in place where you were blowing the asbestos fibers from a
10 boxcar into the surrounding air?

11 A. I believe -- I don't remember the date that we installed
12 it, but as far as I know, it was in use when I left.

13 Q. And when was that?

14 A. 1990.

15 Q. And I thought you described for us a similar process for
16 other parts of the export plant. Didn't you use that same
17 solution to pollution is dilution to other parts of the export
18 plant?

19 A. May have installed a small wall-mounted fan, there
20 again, to provide outside air to the workers inside.

21 Q. Right. And so tell us about that.

22 A. It was just a small -- as I remember, I believe we put
23 in a wall-mounted fan that moved a few CFM of air, just to
24 provide fresh air, make-up air. Dust collector in there, too,
25 so it provided make-up air for a dust collector, also.

1 Q. That dilution, that pulling air into the building,
2 that's what I'm picture, pulling air in, right?

3 A. Yes.

4 Q. And blow air out.

5 A. No, not necessarily, because there's a large dust
6 collector called a bag house, a large fabric filter, so that
7 fan would supply air, make up air to the dust collector so none
8 of that air would really go outside.

9 Q. Because I thought you described something different to
10 us in our meetings, that you actually had the situation where
11 you pulled air into the building and it blew out. What were
12 you talking about?

13 A. I don't -- I don't recall blowing air out. I mean, the
14 air is -- when you exhaust air out of a building, you have to
15 make that air, I believe that was the purpose for the fan.

16 Q. And so you had bags collecting the asbestos fibers?

17 A. Yes.

18 Q. And where did those go when they were full?

19 A. They don't get full, they were continuously cleaning and
20 the material falls down into -- it's like a vacuum cleaner,
21 falls down into a receptacle.

22 Q. Right. So where did that stuff go?

23 A. Actually, that's what we used that vacuum truck for, to
24 pick that up and it was hauled back up to the tailings area, I
25 believe.

Experts Call Vermiculite Potential Health Hazard

By Allen Short

Times-Dispatch Staff Writer

NEW YORK — Vermiculite, a spongy mineral used as a soil additive and as a building insulation material, poses a "potentially serious health hazard" because it contains microscopic asbestos fibers, a federally financed cancer research team has reported.

"There is cause for considerable concern over the industrial and public health implications" associated with the widespread use of the mineral, Dr. Arthur N. Rohl, a mineralogist with Mount Sinai Hospital's department of environmental medicine, told a Times-Dispatch reporter here Monday.

Dr. Rohl and other members of a National Institutes of Health research team here used an electron microscope to isolate chrysotile asbestos fibers — known to cause a rare form of lung cancer — in vermiculite samples from a Lincoln County, Mont., mine.

W.R. Grace & Co., owners of the vermiculite mine from which the tested ore was taken, later Monday issued a statement disputing the research team's findings. A spokesman for the firm denied that any such asbestos fibers are contained in the Montana deposits,

citing research conducted for W.R. Grace by a private firm.

Hazards "Overlooked"

Vermiculite health hazards have been "entirely overlooked if not ignored" by federal mining safety agencies, Dr. Rohl charged in an interview Monday with The Times-Dispatch.

Federal asbestos contamination detection standards, which are employed at the only two active vermiculite mines in the United States, Dr. Rohl said, contain no provisions to protect mine workers — or users of finished vermiculite products — from possible exposure to sub-

Continued on Page 11, Col. 3

Tags on City Car May Violate Statute

By Bill Miller

The city of Richmond may be in violation of state statutes by putting a conventional bicentennial state license tag on a city-owned car assigned to City Atty. Conrad B. Mattox Jr.

State law says that all state, county or city cars — except cars used by the governor, the attorney general, the Division of Industrial Development or "devoted solely to police work" — must bear white-on-blue public use license tags, said Jerry M. Fern, assistant manager of the Division of Motor Vehicles titles and registration office.

To obtain the tag that was put on the city attorney's car, Richmond certified to the Division of Motor Vehicles that the car on which the tag was being put was going to be used "solely for police work," Fern said yesterday.

FERN SAID that in his opinion, the city is violating the state statute if the vehicle is used for anything other than police work. Fern said he had checked the certification filed by the city

Continued on Page 2, Col. 3

Richmond Times-Dispatch, Tues., Sept. 21, 1976 A-11

Dr. Kohlssaidthe fibroblasts found by the Mount Sinai team, which were photographed and cataloged, were identical between the small mammalian sheets of mica which need vermiculite's expansive characteristics when heated.

Members of the cancer research team have hypothesized that when vermiculite ore is expanded micelline ore is exposed through a process known as

Dr. Rohlf termed the alleged shortcomings in federal health hazard detection procedures "ridiculous and potentially dangerous," not only to vermiculite mine workers, but to residents of areas surrounding the mines and to consumers of the bottled product.


MESA officials apparently were not aware until earlier this year of the possibility that

More than 20 outcroppings of vermiculite asbestos are known to exist in the general vicinity of Green Springs. There are no known data, however, to indicate whether they exist

Presented by
Gene Cook Associates, Inc.
1900 Byrd Avenue
Accredited by The Continuing Education Council

Call us today at (804) 285-3579 For a Free Survey.
Out of Town Call Collect.

BEKEE 2000

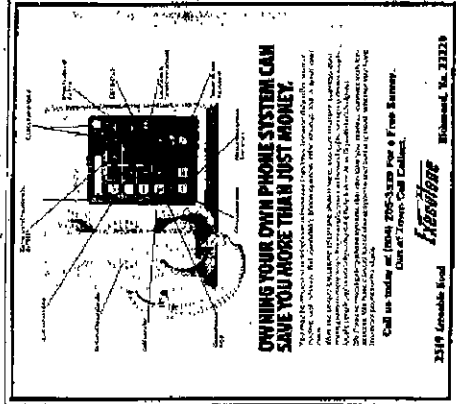


ACCOUNTING MACHINES • ADDING MACHINES

Vermiculite Warning Issued by Research Team

Richmond Times-Dispatch, Tues., Sept. 21, 1976 A-11

Within the past few months, the federal government has issued a warning that vermiculite, a mineral used in asbestos removal, may be a health hazard. The warning was issued by the National Institute for Environmental Health Sciences (NIEHS) in Research Triangle Park, N.C. The warning was based on studies by the NIEHS and the U.S. Environmental Protection Agency (EPA) which found that vermiculite may cause lung cancer in rats. The studies found that rats which inhaled vermiculite for 18 months developed lung tumors. The studies also found that vermiculite may cause lung cancer in humans. The NIEHS and EPA are now conducting further studies to determine the health effects of vermiculite in humans.



OWNING YOUR OWN PHONE SYSTEM CAN SAVE YOU MORE THAN JUST MONEY.

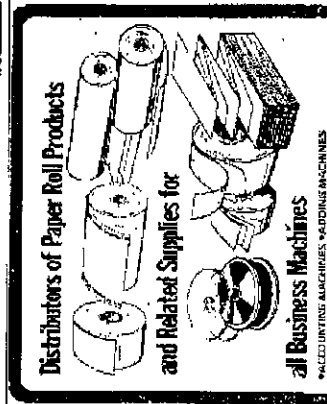
The new 200-3300 Pay & Free Service. Call us today at (703) 205-3300 for a Free Survey. Call us today at (703) 205-3300 for a Free Survey.

their misdeeds. The federal government has issued a warning that vermiculite, a mineral used in asbestos removal, may be a health hazard. The warning was issued by the National Institute for Environmental Health Sciences (NIEHS) in Research Triangle Park, N.C. The warning was based on studies by the NIEHS and the U.S. Environmental Protection Agency (EPA) which found that vermiculite may cause lung cancer in rats. The studies found that rats which inhaled vermiculite for 18 months developed lung tumors. The studies also found that vermiculite may cause lung cancer in humans. The NIEHS and EPA are now conducting further studies to determine the health effects of vermiculite in humans.



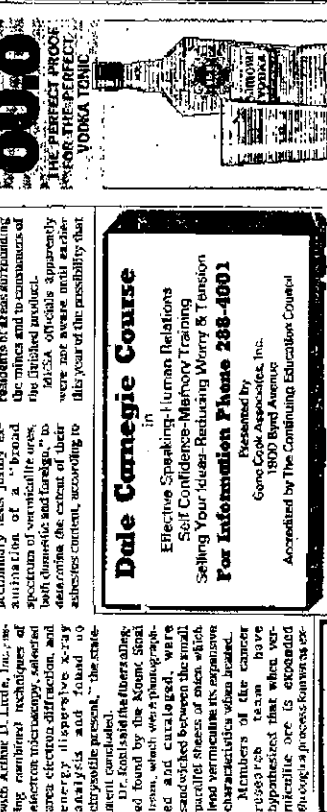
OWNING YOUR OWN PHONE SYSTEM CAN SAVE YOU MORE THAN JUST MONEY.

The new 200-3300 Pay & Free Service. Call us today at (703) 205-3300 for a Free Survey. Call us today at (703) 205-3300 for a Free Survey.



Distributors of Paper Roll Products and Related Supplies for all Business Machines

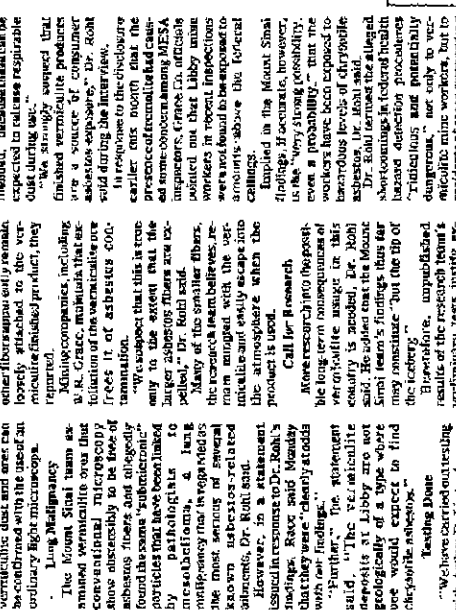
2319 Lenox Road, Marietta, Ga. 30066



868 VODKA

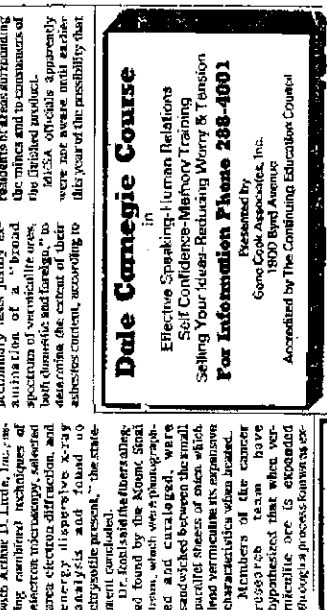
THE PERFECT PROOF FOR THE PERFECT PARTY.

in a report issued by the federal government. The report was based on studies by the NIEHS and the EPA which found that vermiculite may cause lung cancer in rats. The studies found that rats which inhaled vermiculite for 18 months developed lung tumors. The studies also found that vermiculite may cause lung cancer in humans. The NIEHS and EPA are now conducting further studies to determine the health effects of vermiculite in humans.



OWNING YOUR OWN PHONE SYSTEM CAN SAVE YOU MORE THAN JUST MONEY.

The new 200-3300 Pay & Free Service. Call us today at (703) 205-3300 for a Free Survey. Call us today at (703) 205-3300 for a Free Survey.



868 VODKA

THE PERFECT PROOF FOR THE PERFECT PARTY.

Continued From First Page

microscopic asbestos particles. The federal government has issued a warning that vermiculite, a mineral used in asbestos removal, may be a health hazard. The warning was issued by the National Institute for Environmental Health Sciences (NIEHS) in Research Triangle Park, N.C. The warning was based on studies by the NIEHS and the U.S. Environmental Protection Agency (EPA) which found that vermiculite may cause lung cancer in rats. The studies found that rats which inhaled vermiculite for 18 months developed lung tumors. The studies also found that vermiculite may cause lung cancer in humans. The NIEHS and EPA are now conducting further studies to determine the health effects of vermiculite in humans.

Continued From First Page



Dale Carnegie Course

Effective Speaking-Human Relations Self Confidence-Memory Training Selling Your Ideas-Reducing Worry & Tension

For Information Phone 288-4001

Presented by Dale Carnegie & Associates, Inc. 1800 Bond Avenue

Accredited by The Continuing Education Council

Vermiculite Warning Issued by Research Team

Confined From First Page

microscopic asbestos particles.

Federal guidelines, as administered by the Mining Enforcement and Safety Administration, monitor only those fibers whose presence in vermiculite dust and ores can be confirmed with the use of an ordinary light microscope.

Lung Malignancy

The Mount Sinai team examined vermiculite ores that conventional microscopy shows ostensibly to be free of asbestos fibers and allegedly found the same "submicroscopic" particles that have been linked by pathologists to mesothelioma, a lung malignancy that is regarded as the most serious of several known asbestos-related ailments, Dr. Rohl said.

However, in a statement issued in response to Dr. Rohl's findings, Roca said Monday that they were "clearly at odds with our findings."

"Further, the statement said, 'The vermiculite deposits at Libby are not geologically of a type where one would expect to find chrysotile asbestos.'"

Testing Done

"We have carried out testing with Arthur D. Little, Inc., using combined techniques of electron microscopy, selected area electron diffraction, and energy dispersive x-ray analysis and found no chrysotile present," the statement concluded.

Dr. Rohl said the fibers analyzed found by the Mount Sinai team, which were photographed and cataloged, were sandwiched between the small parallel sheets of mica which host vermiculite's expansive characteristics when heated.

Members of the cancer research team have hypothesized that when vermiculite ore is excavated through a process known as ex-

a report issued by the researchers in 1974.

"Apparently a number of vermiculite products, especially consumer products such as potting soils, and [animal] litter, should also be examined," the report recommended, "because there can be expected to release respirable dust during use."

"We strongly suspect that finished vermiculite products are a source of consumer asbestos exposure," Dr. Rohl said during the interview.

In response to the disclosure earlier this month that the presence of tremolite had caused some concern among MESA inspectors, Grace Co. officials insisted that Libby mine workers in recent inspections were not found to be exposed to amounts above the federal ceiling.

Implied in the Mount Sinai findings, if accurate, however, is the "very strong possibility" even a "probability" that the workers have been exposed to hazardous levels of chrysotile asbestos, Dr. Rohl said.

Dr. Rohl termed the alleged shortcomings in federal health hazard detection procedures "ridiculous and potentially dangerous," not only to vermiculite mine workers, but to residents of areas surrounding the mines and to consumers of the finished product.

MESA officials apparently were not aware until earlier this year of the possibility that

within the proposed mining sites.

Dr. Rohl said two samples of the Virginia ore have been obtained by the Mount Sinai team and will soon be analyzed to determine the extent, if any, of their asbestos content.

S.C., according to the United States Bureau of Mines.

OWNING YOUR OWN PHONE SYSTEM CAN SAVE YOU MORE THAN JUST MONEY.

When the telephone company charges you a high bill, it's because they're not giving you the best value for your money. They're not giving you the best value for your money. They're not giving you the best value for your money.

Call us today at (800) 285-3370 for a Free Survey.

One of Three Call Centers.

2319 Gravelle Road **Richmond, Va. 23229**

Fiberline

Distributors of Paper Roll Products and Related Supplies for all Business Machines

ACCOUNTING MACHINES • ADDING MACHINES

86.8

THE PERFECT PROOF FOR THE PERFECT VODKA TONIC

SMOOTH VODKA

Dale Carnegie Course

Effective Speaking-Human Relations Self Confidence-Memory Training

Selling Your Ideas-Reducing Worry & Tension

For Information Phone 288-4001

Presented by Gene Cook Associates, Inc. 1900 Byrd Avenue

Accredited by The Continuing Education Council

08:01:06 1 IN THE SUPREME COURT OF THE STATE OF MONTANA

08:15:21 2

3 CAUSE NO. AC 17-0694

4

IN RE ASBESTOS LITIGATION,

5

Consolidated Cases.

6

7 This document relates to:

Tracie Barnes, et al. v. BNSF Railway, et al.

8

Lincoln County Cause No. DV-16-111

9

10

11

12

VIDEO-RECORDED TELEPHONIC DEPOSITION

13

OF

14

HARVEY VINSON

15

(Taken on Behalf of the Defendant,
BNSF Railway Company)

16

17

18

Taken at the Venture Inn

1015 West Ninth Street

19

Libby, Montana

Wednesday, November 14, 2018 - 1:59 p.m.

20

21

22

23

24

Reported by Jolene Asa, RPR, and Notary Public
for the State of Montana, Flathead County

25

1 A. Not really, no.
 2 **Q. When did you become aware of that?**
 3 A. Well, probably in the late '70s.
 4 **Q. And how did you become aware that there was**
 5 **asbestos in the vermiculite?**
 6 A. Well, I figured with all the dust and stuff
 7 it couldn't be much good for you.
 8 **Q. Strike that as nonresponsive to my question.**
 9 **How did you become aware that there was**
 10 **asbestos in the vermiculite?**
 11 A. I really don't know.
 12 **Q. When you were working in the mill, did you**
 13 **see any signs, any warnings that the product you were**
 14 **working on was hazardous in any way?**
 15 A. No.
 16 **Q. Did you see any signs anywhere that provided**
 17 **a warning that the vermiculite might have been**
 18 **hazardous?**
 19 A. No.
 20 **Q. Would you ever have any conversations with**
 21 **any of your supervisors about the vermiculite being**
 22 **hazardous or having asbestos in it?**
 23 A. No.
 24 **Q. So when you were working at the export**
 25 **facility downtown, was that a dusty operation?**

14

1 A. Yes.
 2 **Q. Constantly?**
 3 A. Yes.
 4 **Q. Was that facility managed by W.R. Grace or**
 5 **the railroad?**
 6 A. By W.R. Grace.
 7 **Q. Whose job was it to clean the property?**
 8 A. Do you mean at the time we worked there?
 9 **Q. Correct.**
 10 A. Nobody cleaned it that I know of.
 11 **Q. So if there was a vermiculite spill, no one**
 12 **would have cleaned it up?**
 13 A. Well, the crew from the mill would probably
 14 come down with the Bobcat and pick it up, load it up
 15 in the truck and haul it back up the hill.
 16 **Q. So you guys bagged vermiculite there. How**
 17 **was it then transported out?**
 18 A. Railroad and truck both.
 19 **Q. And when you say "Railroad," how were the**
 20 **cars loaded?**
 21 A. Well, they were a boxcar, and we loaded them
 22 by hand.
 23 **Q. How did you get the boxcars? Did the**
 24 **railroad drop them off at the premises?**
 25 A. Yes.

1 **Q. And how would you move those cars along as**
 2 **you filled them?**
 3 A. Well, normally we didn't have to move them
 4 as we filled them, because they were just sitting
 5 there, and we'd load one end and load the other end
 6 and then the doorway and shut the doors. Then we had
 7 one of them, I guess you'd call it, a stump puller
 8 with a rope. You'd either pull it out of the road and
 9 pull the next car in, or if it was the last car, we'd
 10 just leave it sit there, and the railroad would come
 11 in and move it out.
 12 **Q. So you had some sort of pulley system that**
 13 **you used?**
 14 A. Right.
 15 **Q. Did you ever complain to anyone about the**
 16 **dust at the export facility?**
 17 A. Could have. I don't remember whether I did
 18 or not.
 19 **Q. Do you recall any markings on the bags of**
 20 **vermiculite stating that the product could be**
 21 **hazardous?**
 22 A. I don't recall any, no.
 23 **Q. Did W.R. Grace ever provide you with a**
 24 **respirator to use while you were working?**
 25 A. Yes.

16

1 **Q. And did you use it?**
 2 A. Sometimes, yes.
 3 **Q. Did they give you any training with that**
 4 **respirator as far as when you should be using it?**
 5 A. When it was real bad or -- showed you how to
 6 put it on and stuff like that, yes.
 7 **Q. Do you recall whether anyone told you what**
 8 **was in the dust in your workplace?**
 9 A. Not that I recall, no.
 10 **Q. I've heard some other folks refer to it as**
 11 **nuisance dust. Did you ever hear people refer to it**
 12 **that way?**
 13 A. Other people, yes.
 14 **Q. Were you a part of the mine union?**
 15 A. Yes.
 16 **Q. Did you go to any mine union meetings?**
 17 A. Right. I did, yes.
 18 **Q. Do you recall dust at the facility, either**
 19 **the export plant, the mill, anywhere in the mine,**
 20 **really -- do you ever recall that being discussed at**
 21 **the union meetings?**
 22 A. I don't remember.
 23 **Q. Were there any railroad workers that worked**
 24 **at the export plant?**
 25 A. No.

1 Q. When there were inspections at the mine,
2 would they come out and inspect the export plant also?

3 A. Yes.

4 Q. Were you present for some of those
5 inspections?

6 A. We were there most of the time that OSHA
7 would show up.

8 Q. Did you have any instructions prior to OSHA
9 showing up about cleaning up the facility?

10 A. Yes.

11 Q. And who did those instructions come from?

12 A. The boss.

13 Q. Who was your boss while you were working at
14 the export facility?

15 A. I had several bosses. Do you want their
16 names?

17 Q. Yes, please.

18 A. One was Dale Thomson and -- actually, Tom
19 DeShazer, he was the construction boss. He was over
20 me because I was out of construction. And Bruce Zwang
21 was another one and Sam Kair. They were over the
22 screening plant.

23 Q. So when OSHA was coming, what would you be
24 instructed to clean up?

25 A. Just the building and make sure the floors

18

1 were clean.

2 Q. You mentioned that bagging the vermiculite
3 caused a lot of dust. Was there dust kicked up when
4 you were loading the bagged vermiculite into the
5 railcars?

6 A. Well, they had a -- after they put the
7 bagging -- new bagging machine in, they put in a dust
8 collector, and then they put in a big pipe that had
9 air blowed in. They put it in -- they put it in the
10 boxcar so it would keep air into the boxcar blowing it
11 out the door. So that's -- I don't know what it was
12 called. It was just a -- about a 16-inch pipe with
13 a -- had a pretty good blast on it so it'd keep it out
14 of the boxcar.

15 Q. So while you were loading those boxcars, did
16 dust collect on the outside of the cars?

17 A. Not on the outside. They did on the
18 machine. They had a dust collector that was on the
19 machine.

20 Q. I think my question is a little bit
21 different. Did dust accumulate on the outside of the
22 railcars?

23 A. On the outside of the railcars? Not really.

24 Q. So once the cars were done loading, would
25 you give the railroad a phone call for them to come

1 pick them up, or how did that work?

2 A. Well, usually it's -- we never -- I just
3 took my slips up to the office, and then they let them
4 know when the car was loaded.

5 Q. About how many cars did you load a day?

6 A. Usually about one.

7 Q. And then you mentioned that you also loaded
8 trucks; is that right?

9 A. Right.

10 Q. How many of those would you have done a day?

11 A. Well, they didn't come in all the time, so I
12 really couldn't -- probably just one.

13 Q. Did you believe that there was anything
14 about the job that you were doing at the export plant
15 that posed a risk to your health?

16 A. Well, not that I recall, anyway. I don't
17 think so.

18 Q. Would you say that the export facility that
19 you worked in was more or less dusty than the dry mill
20 when you worked in it?

21 A. Well, I would say probably less.

22 Q. Did you ever work filling cars for the
23 railroad with bulk vermiculite instead of bagged
24 vermiculite?

25 A. I didn't, no.

20

1 Q. Do you recall any placards or stickers or
2 anything like that that were on the railcars that you
3 were loading vermiculite into?

4 A. On the cars, I put them on, the vermiculite.
5 I put the signs on them myself.

6 Q. On what?

7 A. On the board that they had on the door on
8 the boxcar. That's all we loaded was boxcars down
9 there.

10 Q. And did you put those on the cars the entire
11 time that you worked down at the export facility?

12 A. Every time we sent one out, yes.

13 Q. What did those labels say?

14 A. They said it was asbestosis -- asbestos.
15 Put it that way. And I guess it was a danger sign.
16 It was just a little card about eight inches long,
17 maybe six inches high. It had -- and it said
18 "W.R. Grace" on it, something about asbestos. That's
19 all I can remember.

20 Q. Where did you get those stickers?

21 A. I don't know. Got them from W.R. Grace,
22 I guess. They had them made up. We didn't put them
23 on -- when I first worked down there, I didn't think
24 they had them.

25 Q. Okay.

1 A. And then after -- after a fashion, they got
2 some, so -- but I don't remember what year it started
3 or anything like that. I just remember that we used
4 to put them on there for quite a few years afterwards
5 while I was there.

6 **Q. So when you saw signs saying that there was**
7 **asbestos in the vermiculite, did you ask any questions**
8 **from --**

9 A. No.

10 **Q. -- any of your supervisors?**

11 A. No.

12 **Q. Why is that?**

13 A. I don't know. Just didn't. It was a job.

14 **Q. Do you recall specifically what that label**
15 **would have said?**

16 A. Pardon?

17 **Q. Do you recall specifically what that label**
18 **would have said?**

19 A. Do I know what it said? No, I don't know.
20 I was told to put it on. That's what I did.

21 **Q. Do you recall who told you to put it on?**

22 A. The bosses.

23 **Q. I'm sorry. What year did you say you**
24 **stopped working at the export plant?**

25 A. What year did I stop working there?

22

1 **Q. Correct.**

2 A. 1990. That's when they shut it down.

3 **Q. Can you give me even a decade on when you**
4 **believe you started putting those stickers on the**
5 **cars?**

6 MR. SULLIVAN: I'm going to object. Asked
7 and answered.

8 MS. PATRICK: He said he couldn't give me a
9 specific year.

10 BY MS. PATRICK:

11 **Q. But if you can --**

12 A. I can't. No, I can't.

13 **Q. So were fresh stickers put on each car as**
14 **they came in, or were there stickers already on some**
15 **of the cars that were delivered by the railroad? How**
16 **did that work?**

17 A. Well, I don't remember if there were any on
18 when they come in or not. I just put them on whenever
19 we loaded a car. I can't remember any ever being on.
20 They might have took them off, you know. We don't get
21 the same car in all the time.

22 **Q. Right. No. I understand that. I guess I'm**
23 **trying to figure out -- you said there was a specific**
24 **location where they got placed on the --**

25 A. All the boxcars had a little board on the

1 door, and it was about 12 by 12 or a little bigger,
2 something like that, and it was just a wood in a metal
3 frame, and you just stuck a sticker on it.

4 **Q. So, then, who completed the bills of lading**
5 **that went along with those boxcars?**

6 A. They must have did it at the office. I
7 didn't do it. All I did was took the slip down what
8 was in it, how many bags were in it, and that was it.
9 That was all my job was.

10 **Q. Okay. So the slip that you're talking about**
11 **you would turn in, what information would that have**
12 **had on it?**

13 A. It would have been how many bags were in the
14 boxcar and the boxcar number.

15 **Q. Do you know whether at any point W.R. Grace**
16 **let its customers know that the vermiculite may have**
17 **contained asbestos?**

18 A. I have no idea.

19 **Q. Do you know whether any such information was**
20 **shared with anyone from the railroad?**

21 A. I don't know that either.

22 **Q. Do you have any idea where the shipments of**
23 **vermiculite that you were loading were headed, what**
24 **companies they were going to?**

25 A. No.

24

1 **Q. Did you have seniority to bid a different**
2 **job at any point?**

3 A. That I could bid a job in a different --
4 yeah.

5 **Q. So why did you choose to keep working at the**
6 **export facility?**

7 A. Well, it was a straight day job, and I liked
8 the job. It was close to town.

9 **Q. Do you recall W.R. Grace ever giving**
10 **vermiculite away to folks in the community, workers?**

11 A. No, but I know a lot of people come down and
12 got it out of the piles down there that was -- that we
13 had out, but no. I don't know that they ever told
14 them they could have it.

15 **Q. When you say "The piles," what do you mean?**

16 A. Well, if I had -- if I had to move -- if I
17 had to change ore, different sizes of ore, I used to
18 have to empty a hopper, and we'd take and dump it out
19 by the side of the building there, and then they'd
20 come up and pick it up with the Bobcat and a dump
21 truck when it got enough there, and a lot of people
22 would come and get it there.

23 **Q. So you would dump it out when you were doing**
24 **a different size, and then would you -- would the**
25 **product that got dumped out get taken back up to the**

Invoice Date, Plant Number, Shipped To, Quantity, & Description

Invoice dates of 12/31/2005=unknown or illegible

Invoice		Ship To Company /		Shipped To Location City & State		Notes (as written on Invoice)	
Date	Plant #	Division Name					
> 11/16/1988	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons Pounds							
32.50	65,000.00	No. 2 Crude Vermiculite					
> 6/26/2000	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons Pounds							
95.00	190,000.00	No. 2 Crude Vermiculite, No. 3 Crude Vermiculite					
> 6/13/1985	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons Pounds							
32.50	65,000.00	No. 2 Crude Vermiculite					
> 6/13/1985	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons Pounds							
64.10	128,200.00	No. 3 Crude Vermiculite					
> 4/2/1985	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons Pounds							
32.50	65,000.00	No. 2 Crude Vermiculite					
> 4/2/1985	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons Pounds							
64.00	128,000.00	No. 3 Crude Vermiculite					
> 5/13/1986	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons Pounds							
96.80	193,600.00	No. 2 Crude Vermiculite, No. 3 Crude Vermiculite					
> 1/14/1986	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons Pounds							
96.60	193,200.00	No. 2 Crude Vermiculite, No. 3 Crude Vermiculite					
> 10/24/1986	711	Robinson Insulation Company	1226 River Drive		Great Falls, MT		
Tons Pounds							
96.40	192,800.00	No. 2 Crude Vermiculite, No. 3 Crude Vermiculite					

Monday, November 27, 2017

Enforcement Confidential

Page 1 of 3

Invoice **Ship To Company /** **Shipped To Location City & State** **Notes (as written on Invoice)**

Date **Plant #** **Division Name**

> 10/30/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

96.40 192,800.00 No. 3 Crude Vermiculite, Oil Treated

> 8/20/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

96.10 192,200.00 No. 2 Crude Vermiculite, Oil Treated, No. 3 Crude Vermiculite, Oil Treated

> 2/2/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

96.60 193,200.00 No. 3 Crude Vermiculite No. 2 Crude Vermiculite

> 12/31/2005 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

61.70 123,400.00 Hopper (2) No. 2 Crude Vermiculite

32.00 64,000.00 Hopper (3) No. 3 Crude Vermiculite

> 10/1/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

97.20 194,400.00 No. 3 Crude Vermiculite, Oil Treated, No. 4 Crude Vermiculite, Oil Treated

> 8/20/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

96.10 192,200.00 No. 2 Crude Vermiculite, No. 3 Crude Vermiculite, Oil Treated

> 11/16/1988 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

64.20 128,400.00 No. 3 Crude Vermiculite

> 9/1/1988 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Construction Products Division

Tons Pounds

32.50 65,000.00 No. 2 Crude Vermiculite

> 2/21/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

96.60 193,200.00 No. 2 Crude Vermiculite, No. 3 Crude Vermiculite, Oil Treated

Monday, November 27, 2017

Enforcement Confidential

Invoice **Ship To Company /** **Shipped To Location City & State** **Notes (as written on Invoice)**

> **Date** **Plant #** **Division Name** **1226 River Drive** **Great Falls, MT**

Tons Pounds

> 4/2/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

> 6/13/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

> 5/4/1988 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

> 3/28/1988 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

> 1/7/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

> 1/14/1986 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

> 10/1/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

> 10/30/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

> 1/7/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

> 1/14/1986 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

> 10/1/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

> 10/30/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

> 1/7/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

> 1/14/1986 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

> 10/1/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

> 10/30/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

> 1/7/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

> 1/14/1986 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

Tons Pounds

> 10/1/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

> 10/30/1985 711 Robinson Insulation Company 1226 River Drive Great Falls, MT

State Subtotals **State** **MT**

Monday, November 27, 2017

Enforcement Confidential

Page 3 of 3

Invoices: 27

Invoices: 27



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII (8EPR-PS)
999 18th STREET - SUITE 300
DENVER, COLORADO 80202-2466



MEMORANDUM

SUBJECT: Fibrous Amphibole Contamination in Soil and Dust at Multiple Locations in Libby Poses an Imminent and Substantial Endangerment to Public Health: an Addendum to my Memorandum of May 10, 2000

FROM: Christopher P. Weis, Ph.D., DABT.
Science Support Coordinator
Libby Asbestos Site

TO: Paul Peronard, On-Scene Coordinator
Libby Asbestos Site

I PURPOSE

This memorandum presents the rationale for determination of imminent and substantial endangerment to public health from asbestos contamination in soil and soil-like material at multiple locations in and around the community of Libby, Montana. With this memorandum I confirm and extend a similar conclusion derived in a previous memorandum from my office to you dated May 10, 2000. The May 10 memorandum includes background and site conceptual information important for conclusions and recommendations presented herein.

II SUMMARY OF FINDINGS

- 1) Asbestos material is present in soil, raw ore, ore concentrate and other soil-like materials at multiple locations in and around the community of Libby. This asbestos material is primarily a friable amphibole containing a series of closely related minerals including actinolite, tremolite, winchite and richterite. Asbestos fibers of this type are known to be hazardous to humans when inhaled.
- 2) Mechanical disturbance of asbestos-contaminated soil or related materials by activities similar to those that are likely to be performed by area residents or workers results in elevated levels of respirable asbestos fibers in air. The concentrations of these fibers in air frequently exceed OSHA guidelines, and estimated excess cancer risks can exceed EPA's typical guidelines by an order of magnitude or more in some cases.
- 3) On this basis, it is concluded that soils and other similar materials that contain elevated levels of friable asbestos minerals are a likely source of on-going

release of hazardous fibers to air, and that it is necessary to reduce or eliminate pathways of exposure of this material to residents and workers.

III BACKGROUND

Vermiculite was discovered in the Rainy Creek Mining District of Lincoln County, Montana in 1916 by E.N. Alley. Alley formed the Zonolite Company and began commercial production of vermiculite in 1921. Another company, the Vermiculite and Asbestos Company (later known as the Universal Insulation Company), operated on the same deposits (BOM, 1953). W.R. Grace purchased the mining operations in 1963 and greatly increased production of vermiculite until 1990 when mining and milling of vermiculite ceased.

Vermiculite ore bodies on Zonolite Mountain are associated with amphibole asbestos concentrations ranging up to nearly 100% in selected areas (W.R. Grace). Although early exploration and mining efforts by the Zonolite Company focused upon the commercial viability of fibrous amphibole deposits found on Zonolite Mountain (DOI, 1928) no commercial production of asbestos from the Libby mine is reported. During early mining operations airborne fiber concentrations at the mine exceeded 100 fibers/cc in several job classifications (Amandus et al, 1987). Historical airborne fiber concentrations in the residential area of Libby exceeded the present occupational Permissible Exposure Level (PEL) of 0.1 fiber/cubic centimeter established by OSHA 1994 (MRI, 1982; Eschenbach deposition). This exposure limit is recognized as being associated with significant risk (3.4 additional asbestos-related cancers per 1000 individuals as per OSHA estimates) but is the practical lower limit of detection using phase contrast microscopy (PCM) as a measurement technique (OSHA, 1994).

Residual fiber contamination from the subject facilities continues to present potential exposure to workers, residents, and visitors at these facilities but is presently being addressed under removal authorities provided in the Comprehensive Environmental Response Compensation and Liability Act Section 104 (CERCLA or Superfund). These actions by the U.S. Environmental Protection Agency Region 8 office in Denver, CO began on November 22, 1999 and continue today. The investigative team is working closely with Local, State, and other Federal Agencies to determine the nature and extent of mineral fiber contamination throughout Libby, and to take appropriate action to protect the health of current residents and workers.

IV ENDANGERMENT RATIONALE

The rationale for determination of imminent and substantial endangerment is four-fold:

- 1) Asbestos fibers from the Libby mine site are hazardous to humans as evidenced by the occurrence of asbestos-related disease in area workers and residents. Workers exposed to asbestos fibers at the Libby mine site have been shown to experience clear and significant increases in the incidence of asbestos-related conditions, including asbestosis, lung cancer and mesothelioma. Asbestos-related lung

diseases among have also been observed in area residents with no direct occupational exposures, including family members of mine workers, and even in those with no known association with the vermiculite mining or processing;

- 2) Asbestos fibers can be detected in soil and/or related materials at multiple locations around the community. These contaminated materials constitute a potential source of asbestos exposure of area residents and workers;
- 3) Asbestos fibers in contaminated soil or related material may be released into air by a variety of activities similar to those that area residents or workers may engage in under normal living and working conditions. This demonstrates that a complete exposure pathway exists by which asbestos-contaminated source materials may cause inhalation exposure of area residents or workers;
- 4) The concentrations of asbestos fibers that occur in air following mechanical disturbance of contaminated soil or dust have been found to often exceed: a) OSHA guidelines for the protection of workers during an 8 hour workday (0.1 f/cc) and during excursion events (1 f/cc for 30 minutes), and b) EPA's guidelines regarding acceptable lifetime excess cancer risks for both residents and workers.

Summaries of the evidence supporting each of these elements of rationale are presented below.

1. Libby Asbestos Fibers Are Hazardous to Human Health (Hazard Assessment)

Evidence of the adverse effects from exposure to asbestos fibers associated with the vermiculite ore body on Zonolite Mountain is abundant. During the 1980s, MacDonald et al. (1986 a,b), and Amandus et al. (1987a,b,c) conducted investigations of asbestos exposure, and the morbidity and mortality of workers involved in various aspects of vermiculite mining, milling and refining processes in Libby, MT. These investigations found that workers had significantly increased occurrence of asbestosis, lung cancer, mesothelioma, and asbestos-related pleural disease associated with exposure to the vermiculite. Additionally, increased asbestos-related lung abnormalities were found among workers at an expansion plant in Marysville, Ohio, that were exposed to vermiculite from the Libby mine, Lockey et al. (1984).

Since the cessation of vermiculite mining and processing operations in Libby, local physicians and nearby pulmonary specialists have continued to identify individuals suffering from asbestosis, lung cancer and mesothelioma as a result of exposure to asbestos mineral fibers. One board-certified pulmonologist has reportedly seen over 150 cases of asbestos-related disease from the Libby area (Whitehouse, 2000). In addition to former mine workers, this physician reported striking findings of asbestos-related disease among household contacts of former workers and among area residents with no identifiable connection to the former mine or processing activities. Some of those area residents with asbestos-related disease and no connection to the mining operations were reportedly exposed to vermiculite through activities such as playing in open piles near recreational parks, gardening, and contact with home insulation. Reports by area physicians are supported by recent morbidity and mortality assessments of Libby residents conducted by the Agency for Toxic Substances and Disease Registry (ATSDR). A mortality study for Libby area

residents from 1979 to 1998, found increased rates of asbestosis (40-60 times higher than the normal background rate for the United States) and mesothelioma (ATSDR 2000). Additionally, ATSDR, USPHS, and EPA conducted a medical testing program from July through November, 2000, of over 6000 individuals that worked or lived in Libby for at least six months prior to 1991. Preliminary analysis of data from over 1000 of the medical testing participants indicated that overall about 20% had chest x-ray abnormalities (identified by at least 2 of 3 B-readers) consistent with asbestos exposure (ATSDR, 2001). Of note, almost 40% of those identified with chest x-ray abnormalities had no occupationally-related vermiculite exposures. Asbestos-associated radiologic abnormalities, similar to those observed among medical testing participants in Libby, have been shown in other populations to be associated with significant progression of disease, morbidity, and mortality (Miller, 1983; Cookson, 1986; Rosenstock, 1991; Erlich, 1992; Hillerdal, 1997).

2. Asbestos Fibers Occur in Soil and Dust at the Site (Source Characterization)

EPA has collected samples of dust, soil, and other soil-like materials at numerous locations in and around the mine site and the community of Libby. In accord with common practice, examination and evaluation of these materials was performed using polarized light microscopy (PLM), as detailed in the *Sampling and Quality Assurance project Plan (Revision 1) for Libby, MT* (USEPA, 2000). Example results are shown in Table 1. As seen, concentrations of asbestos as high as 10-15% have been detected in some materials. Even though some samples do not contain asbestos levels that are detectable by PLM, it is very important to understand that the PLM method has a relatively high detection limit for asbestos (about 1%), and that other microscopic techniques have shown that many soil-type samples that are below the limit of

**TABLE 1. EXAMPLE PLM DATA
FOR SOIL AND SOIL-LIKE MEDIA**

Location	Detection Frequency	Concentration (%)
Export Plant	49/113	<1% - 10%
Screening Plant	125/301	<1% - 6%
Rainy Creek Road	22/72	<1% - 5%
Residential/commercial properties	56/459	<1% - 10%
Schools	28 / 88	<1% - 15%
Daycare	7 / 16	<1%-1%
Conveyer area	3 / 29	<1% - 2%

detection by PLM do contain high levels of asbestos fibers. For example, Figure 1 is a scanning electron microscope (SEM) image of a soil material that was below the limit of detection by PLM, but which clearly contains high levels of asbestos fibers. EPA is working to develop SEM and other related methods for the analysis of soil, but the methods

are not yet sufficiently refined to support quantitative estimates of fiber concentration. Nevertheless, these data support the qualitative conclusion that soils from the site that contain levels above the detection limit by PLM and/or those that contain high levels of asbestos fibers when examined by SEM are sources of potential concern.

3. Disturbance of Contaminated Source Materials can cause a Respiratory Hazard: (Exposure Assessment)

Asbestos fibers in soil or dust are not inherently hazardous to humans if left undisturbed.

However, most soils and dusts are subject to disturbance, either now or in the future, by many different types of activities that are common for residents or workers. Through our investigations we have collected substantial data at the site that demonstrate that disturbance of contaminated source materials may lead to the release of asbestos fibers into air.

Figure 1: Scanning Electron Micrograph (SEM) image of an asbestos bundle observed in a sample reported as "non-detect" by Polarized Light Microscopy (PLM). USGS - Denver

Studies at the Export Plant and the Screening Plant

The initial investigation of potential exposure to asbestos fibers in air during activities that might disturb asbestos-contaminated source material was conducted at the Export Plant and the Screening Plant during spring and summer, 2000. Two EPA workers at each location were fitted with protective equipment and personal air samplers to measure fiber concentrations that occurred directly in the breathing zone. The workers then engaged in routine activities consistent with ongoing work practices at the site. These activities included sweeping floors and organizing material stored in an on-site warehouse. The samples were analyzed by transmission electron microscopy (TEM) using ISO 10312 counting rules. The results are shown in Table 2, stratified according to fiber diameter and length. As seen, concentrations above the OSHA occupational limit of 0.1 f/cc were observed

TABLE 2 TEM RESULTS FOR PERSONAL AIR SAMPLES AT THE EXPORT AND SCREENING PLANTS

Location	Activity	TEM Amphibole Fiber Concentration (f/cc)			
		d > 0.5	d < 0.5 l = 0.5-5	d < 0.5 l = 5-10	d < 0.5 l > 10
Export Plant	Sweeping floors	0.323	0.323	< 0.16	< 0.16
	Moving bags,	1.014	0.507	0.507	0.338

	sweeping floor				
Screening Plant	Sweeping floor	0.222	0.259	0.352	0.111
	Bagging soil, sweeping floor	1.222	< 0.61	3.055	1.222

d = fiber diameter (μm)

l = fiber length (μm)

for most size classes. This demonstrates that, in the presence of contaminated soil and dust, routine activities can generate very high concentrations of asbestos fibers in air.

As a consequence of this initial finding, EPA collected a number of additional personal air samples for workers engaged in removal activities at the screening plant. The W.R. Grace company collected similar personal air samples for workers engaged in removal activities at the export plant. All of these samples were analyzed by PCM, and the results are summarized below:

Location	Detection Frequency	PCM Fiber Concentration (f/cc)		N > 0.1 f/cc
		Average	Maximum	
Screening Plant	205 / 259	0.070 (a)	1.72	41
Export Plant	157 / 186	0.140 (b)	1.60	69

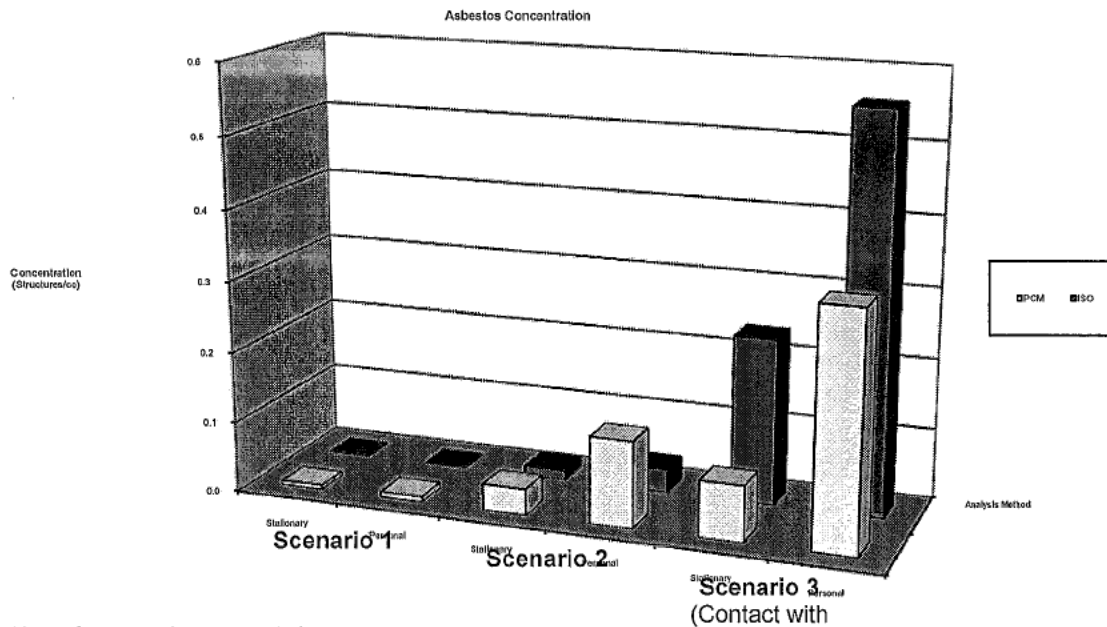
(a) Non-detects evaluated by assuming a value equal to the Limit of Detection (sensitivity)

(b) Limit of detection not reported; non-detects evaluated by assuming a value of zero

As seen, fibers were detected in a majority of air samples, with many samples well in excess of the OSHA PEL of 0.1 f/cc for an 8 hour workday. These data further establish that activities which disturb contaminated source materials are likely to release high concentrations of fibers into the surrounding air.

Studies in Area Residences (Phase 2 Investigation)

Disturbance of contaminated source materials with resultant exposure to fibers in air may occur not only at the former vermiculite processing facilities, but also in people's residences. In order to investigate the potential for this type of exposure, we are currently performing a Phase 2 investigation. The design of this investigation is presented in the *Phase 2 Sampling and Quality Assurance Project Plan (Revision 0) For Libby, Montana* (USEPA 2001). In brief, personal air monitors are used to measure the concentration of asbestos fibers in the breathing zone of people engaged in a series of scenarios that involved routine and special activities in the home, as follows:



Note: Concentrations presented are

Scenario 1: Routine household activities

Scenario 2: Active cleaning activities (dusting, sweeping, vacuuming, etc)

Scenario 3: Simulated remodeling (direct contact with vermiculite insulation)

Air samples are also collected during the activities using stationary air monitors located in the home. Both personal and stationary air samples collected during these activities are analyzed both by PCM and by TEM. Although Phase 2 sampling and analysis activities are not yet complete, preliminary data are available. These preliminary data (based on samples above the detection limit only) are summarized in Table 3 and are shown graphically in Figure 2. For ease of comparison, the values for TEM samples are presented as estimated PCM-equivalents, calculated by summation of the concentrations of all bin sizes that contain fibers likely to be included in a PCM count. Inspection of this Figure reveals the following main points:

- a) Concentrations measured by personal air samplers tended to be higher than for stationary air monitors located in the house, supporting the conclusion that human activities that disturb asbestos fibers can result in local elevations in fiber concentration that are not well captured by whole-house monitoring.
- b) Concentration values were substantially higher during active cleaning activities (scenario 2) than during routine household activities (scenario 1). Likewise, levels were even higher when activities included disturbance of vermiculite insulation (scenario 3).
- c) Elevations are detectable both by PCM and TEM analysis. In many cases, the concentrations of fibers estimated by PCM are higher than by TEM, suggesting that some (but not all) of the fibers detected by PCM are non-asbestos.

TABLE 3 MEAN FIBER CONCENTRATIONS MEASURED DURING PHASE 2

Phase 2 Scenario	Sample Type	Mean Asbestos Concentration (f/cc) (a)	
		PCM	TEM PCME (b)
Scenario 1 (Routine activities)	Stationary	0.006	0.001
	Personal	0.008	0.001
Scenario 2 (active cleaning)	Stationary	0.037	0.013
	Personal	0.122	0.033
Scenario 3 (simulated remodeling)	Stationary	0.079	0.235
	Personal	0.332	0.557

(a) Values are the means of non-zero samples that were above the limit of detection

(b) The concentration shown is an approximation of the PCM-equivalent (PCME) concentration, calculated as the sum of three size bins: $d < 0.5$ and $l = 5-10$, $d < 0.5$ and $l > 10$, and $d > 0.5$. This third bin was included because the fibers in this bin are mainly long ($l > 5$), and all have an aspect ratio greater than 5/1.

Studies at Rainy Creek Road

A third study was conducted by collecting air samples from locations along Rainy Creek Road. As noted above, the soil of Rainy Creek Road is known to contain asbestos at concentrations up to 5% at some locations, and these fibers may be disturbed and resuspended in air by vehicular traffic along the road. The results are summarized in Table 4. As seen, concentration levels of asbestos fibers are lower than for the other locations and scenarios described above, but the values shown represent long-term average concentrations resulting from short releases produced by passing vehicles, followed by longer intervals with low release when no vehicle is passing. Thus, the levels are clearly elevated compared to background, and indicate that vehicle traffic on an asbestos contaminated roadway is a source of potential concern.

TABLE 4 AIR SAMPLE RESULTS FOR RAINY CREEK ROAD

Analytical method	Fiber size class	Concentration in Air (f/cc)	
		Average(a)	Maximum
TEM (ISO 10312)	d > 0.5 AR > 5/1	0.0005	0.0096
	d < 0.5 l = 0.5-5	0.0002	0.0116
	d < 0.5 l = 5-10	0.0001	0.0050
	d < 0.5 l > 10	0.0001	0.0029
PCM	l > 5 AR > 3/1	0.0013	0.019

d = fiber diameter (um)

l = fiber length (um)

AR = aspect ratio (l/d)

(a) Average concentration for values calculated using zero for non-detects.

Taken together, the data from these three different lines of investigation all strongly support the concept that active disturbance of asbestos-contaminated source materials can result in high concentrations of asbestos fibers in the breathing zone.

4. Fiber Concentrations in Air are of Human Health Concern (Risk Characterization)

Exceedences of OSHA Standard

As noted above, multiple air samples collected during investigations to assess the effect of source disturbance have exceeded the OSHA occupational guideline of 0.1 f/cc. Occupational guidelines for asbestos are not protective for non-asbestos workers or residents for several reasons (USEPA, 1995). Occupational guidelines are intended to protect workers who, a) are fully aware of the hazards of the occupational environment, b) have specific training and access to protective equipment such as respirators and/or protective clothing and, c) actively participate in medical monitoring. Never-the-less, occupational data acquired at the site are summarized in Table 5. These data demonstrate that a variety of different types of activities at a variety of different locations within Libby have the potential to generate hazardous airborne levels of asbestos.

TABLE 5 EXCEEDENCES OF OSHA STANDARD

Location	Activity	Exceedance Frequency (a)	
		PCM	TEM-PCME
Export Plant	Sweeping, moving		2 / 2
	Removal activities	69 / 186	
Screening plant	Sweeping, moving		2 / 2

	Removal activities	42 / 261	
Rainy Creek Road	Vehicular traffic	0 / 87	0 / 133
Residences (Phase 2)	Routine	0 / 8	0 / 19
	Active cleaning	24 / 115	1 / 117
	Simulated remodeling	12 / 24	9 / 24

(a) Frequency based on personal air samples for all scenarios except Rainy Creek Road, which is based on stationary air samples. All Non-detects evaluated by assuming a value of zero.

Screening Level Cancer Risk Estimates

A number of alternative methods have been developed for estimating the risk of lung cancer and/or mesothelioma in humans from inhalation of asbestos fibers. Risk models developed by USEPA (1986), NIOSH (Stayner et al. 1997), and NRC (1984) all take the following form:

$$\text{Risk} = \text{Concentration (PCM f/cc)} * \text{Slope factor (risk per PCM f/cc)}$$

The slope factors derived by these different groups are presented below:

Group	Slope factor (Risk per f/cc)
EPA (1986)	0.23
Stayner et al. (1997)	0.078
NRC (1984)	0.154

These slope factors are intended to apply to long-term average concentrations rather than peak concentrations that occur during short-term activities, so application of the basic risk model to the evaluation of intermittent exposures requires a term to account for the less than continuous nature of the exposure:

$$\text{Risk} = \text{Concentration (PCM f/cc)} * \text{TWF} * \text{Slope Factor (risk per PCM f/cc)}$$

where:

TWF = Time-weighting factor to account for less-than-lifetime exposure via the activity being evaluated. For example, if an activity were performed for 1 hour per day, three days per week for 50 years, the TWF would be $1/24 * 3/7 * 50/70 = 0.0128$.

EPA is in the process of obtaining site-specific data on the likely exposure frequency and duration (TWF) for the various scenarios of potential concern, but plausible screening level exposure

frequencies and durations are shown in Table 6. These values are generally similar to the RME exposure assumptions commonly employed for residents and workers at other Superfund sites, except that the exposure duration for residents (40 years) was assumed to be somewhat higher than the normal default (30 years) due to greater stability of the Libby community.

TABLE 6 SCREENING LEVEL EXPOSURE PARAMETERS

Location	Activity	Exposure Assumptions				
		Population	hrs/dy	days/yr	yrs	TWF
Area residences	Scenario 1 (Routine)	Residents	16	350	40	0.3653
	Scenario 2 (Cleaning)	Residents	2	50	40	0.0065
	Scenario 3 (Remodeling)	Contractor	8	250	25	0.0815
Screening plant	Removal	Contractor	8	250	25	0.0815
	Sweeping	Contractor	8	250	25	0.0815
Export plant	Removal	Contractor	8	250	25	0.0815
	Sweeping	Contractor	8	250	25	0.0815
Rainy Creek Rd	Vehicle traffic	Nearby resident	24	350	40	0.5479

Concentration values used in these calculations are all based on measured values in site samples. Because detection limits were rather high in some samples (due to a small volume of air and/or a small number of grid openings counted), all non-detect values were evaluated by assigning a value of zero. Note that this approach is likely to underestimate the true level of risk, although the magnitude of the underestimation cannot be quantified. When samples were counted using ISO 10312 rules, the concentration of PCM fibers were estimated by summing all fibers longer than 5 μm and thinner than 0.5 μm , plus all fibers thicker than 0.5 μm . This approach might tend to overestimate the concentration of PCME fibers since some fibers that are thinner than 0.5 μm will be too thin to detect by PCM. However, this is not likely to cause a significant overestimation because a majority of fibers detected at the site tend to be thicker than 0.25 μm (visible by PCM). Fibers thicker than 0.5 μm were included in the estimate because most of the fibers in this bin are long and meet the definition of a PCM fiber. In most cases the samples used for risk evaluation are personal air samples, and thus represent the fiber concentration in the breathing zone of the exposed person. For samples along Rainy Creek Road, stationary air sampler data were employed to estimate the exposure of people who live near the road (now or in the future).

**FIGURE 3: ESTIMATED SCREENING-LEVEL CANCER
RISK ESTIMATES**



country).
related
number of

Libby residents. Asbestos exposure, as evidenced by non-malignant chest radiographic abnormalities, is also associated with an increased lifetime risk of lung cancer, especially among smokers. The models used to estimate cancer risk do not account for increased risk as a result of prior lung disease. Thus risks in Libby may be significantly higher as a result of historical exposure.

V CONCLUSIONS

Asbestos contamination exists in soil, raw ore, ore concentrate, and other soil-like media at multiple locations in and around the community of Libby. If these contaminated sources are disturbed by human activities, fibers are likely to be released to air. The concentration levels released to air depend on the concentration of fibers in the source material and on the nature of the disturbance. Risks are proportional to the concentration of fibers in air and the frequency and duration of exposure. While data are not yet sufficient to perform reliable human-health risk evaluations for all sources and all types of disturbance, it is apparent that releases of fiber concentrations higher than the OSHA PEL may occur in some cases, and that health risks to residents and workers exceed the risk range usually used by EPA for at least some locations. The occurrence of non-occupational asbestos-related disease among Libby residents is extremely unusual, and has not been associated with asbestos mines elsewhere, suggesting either very high and prolonged environmental exposures and/or increased toxicity of this form of amphibole asbestos. On this basis, I recommend that steps be taken to further identify, quantify, minimize and/or eliminate pathways of human exposure to amphibole asbestos in the vicinity of Libby.

VI REFERENCES

- Amandus, H.E., Wheeler, P.E., Jankovic, J., and Tucker, J. 1987a. *The morbidity and mortality of vermiculite miners and millers exposed to tremolite-actinolite: Part I. Exposure estimates.* Am J of Ind. Med 11:1-14.
- Amandus, H.E., Althouse, R., Morgan, W.K.C., Sargent, E.N., and Jones, R. 1987b. *The morbidity and mortality of vermiculite miners and millers exposed to tremolite-actinolite: Part III. Radiographic findings.* Am. J. of Ind Med 11:27-37.
- Amandus, H.E., and Wheeler, R. 1987c. *The morbidity and mortality of vermiculite miners and millers exposed to tremolite-actinolite: Part II. Mortality.* Am. J. of Ind Med. 11:15-26.
- ATSDR 2000. Health Consultation: Mortality from asbestosis in Libby, Montana. CERCLIS No. MT0009083840. December, 12, 2000. DHHS, ATSDR, DHAC; Atlanta, GA.
- ATSDR 2001. Preliminary findings of medical testing of individuals potentially exposed to asbestiform minerals associated with vermiculite in Libby, Montana: an interim report for community health planning. February 22, 2001. DHHS, ATSDR; Atlanta, GA.
- BOM. 1953. *Vermiculite.* Bureau of Mines Information Circular 7668.
- Cookson, W, De Klerk, N, Musk, AW, et. al. 1986. *The natural history of asbestosis in former crocidolite workers of Wittenoom Gorge.* Am. Rev. Respir. Dis. 133:994-998.
- Erlich R, Lilis R, Chan E, Nicholson WJ, Selikoff IJ. 1992. *Long term radiological effects of short term exposure to amosite asbestos among factory workers.* Brit. J. Indust. Med. 49:268-275.

DOI. 1928. *Contributions to Economic Geology Part 1: Metals and Nonmetals Except Fuels*. Department of the Interior, U.S. Geological Survey. Bulletin 805. U.S. Government Printing Office. p. 24-27.

Eschenbach Deposition Exhibit 182.126. Nelson, Ryan & Albert vs. W.R. Grace. *Airborne fiber concentrations in downtown Libby*. W.R. Grace and Company. 62 Whitmore Ave. Cambridge, MA.

Grace. Geologic Map of the Zonolite Open Pit Mine. (Plate 2) Lincoln County, MT. MLSB 000270.

Lockey, J.E., Brooks, S.M., Jarabek, A.M., Khoury, P.R., McKay, R.T., Carson, A., Morrison, J.A., Wiot, J.F. and Spitz, H.B. 1984. *Pulmonary Changes after Exposure to Vermiculite Contaminated with Fibrous Tremolite*. Am Rev. Respir. Dis. 129:952-958.

Hillerdal, G, Henderson, DW. 1997. *Asbestos, asbestosis, pleural plaques and lung cancer*. Scand. J Work Environ. Health 23:93-103.

MacDonald, J.C., McDonald, A.D., Armstrong, B., and Sebastien, P. 1986a. *Cohort study of mortality of vermiculite miners exposed to tremolite*. Brit. J. of Ind. Med 43:436-444.

MacDonald, J.C., Sebastien, P, and Armstrong, B. 1986b. *Radiological survey of past and present vermiculite miners exposed to tremolite*. Brit. J. of Ind. Med 43:445-449.

Miller, A, Teirstein AS, Selikoff IJ. 1983. *Ventilatory failure due to asbestos pleurisy*. Amer. J. Med. 75:911-919.

MacDonald, J.C., McDonald, A.D., Armstrong, B., and Sebastien, P. 1986. *Cohort study of mortality of vermiculite miners exposed to tremolite*. Brit. J. of Ind. Med 43:436-444.

MRI. 1982. *Collection analysis, and characterization of vermiculite samples for fiber content and asbestos contamination. Final report*. Washington, DC; U.S. Environmental Protection Agency. Contract No. 68-01-5915

NRC. 1984. *Asbestiform Fibers - Non-occupational Health Risks*. National Research Council, Committee on Non-Occupational Health Risk.

Rosenstock, L. 1991. *Roentgenographic manifestations and pulmonary function effects of asbestos-induced pleural disease*. Toxicology and Indust. Health 7:81-87.

OSHA. 1994. *Occupational Exposure to Asbestos*. Federal Register 59(153):40978-82.

Stayner L, Smith R, Bailer J, Gilbert S, Steenland K, Dement J, Brown D, Lemon R. 1997. *Exposure-response analysis of risk of respiratory disease associated with occupational exposure to chrysotile asbestos*. Occup. Environ. Med. 54:646-652.

USEPA. 1986. *Airborne Asbestos Health Assessment Update*. U.S. Environmental Protection Agency, Office of Research and Development. Washington DC. EPA/600/8-84/003F. June 1986.

USEPA. 1995. *Regional Technical Position Paper on the Proper Use of Occupational Health Standards for Superfund Baseline Risk Assessments*. February 13, 1995.

USEPA. 1999. Interim methodology for Conducting Risk Assessment at Asbestos Superfund Sites. parts 1 and 2. U.S. Environmental protection Agency Region 9. Prepared by D. W. Berman (Aeolus, Inc.) and K. Crump (ICF Kaiser Engineers, Inc.) Feb. 15, 1999.

USEPA. 2000. *Sampling and Quality Assurance project Plan (Revision 1) for Libby, MT.* Prepared by USEPA Region 8 with technical support from ISSI Consulting Group.

USEPA. 2001. *Phase 2 Sampling and Quality Assurance Project Plan (Revision 0) For Libby, Montana. Environmental Monitoring for Asbestos. Evaluation of Exposure to Airborne Asbestos Fibers During Routine and Special Activities.* Prepared by USEPA Region 8 with technical support from Syracuse Research Corporation.

Weis, C.P. 2000. *Residual mineral fiber contamination at the former W.R. Grace Screening Plant and Export Plant poses an imminent and substantial endangerment to public health.* Memorandum from Christopher P. Weis, USEPA Regional Toxicologist, to Paul Peronard, USEPA On-Scene Coordinator for the Libby Asbestos Site. Dated 5/10/2000.

Whitehouse, A. 2000. Presentation minutes from Cincinnati review meeting hosted by EPA and ATSDR. February 22-23, 2000.